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Testing

Programmer Aptitude Tests Worth the Risk

By Lois Paul
CW Staff

Despite general paranoia about the Equal Employment Opportunity Commission, a number of companies are successfully using aptitude testing to screen applicants for entry-level programming jobs.

The consensus seems to be that this type of screening saves DP training dollars and is worth the risk of class action suits encountered whenever a qualifying test is implemented, *Computerworld* found in recent interviews with those responsible for hiring and training entry-level programmers.

An aptitude test "is not going to be 100%, but it gives you a much better probability of the candidate being successful," maintained Bradley W. Nelson, an independent consultant in Renton, Wash.

At the Shawmut Bank of Boston, which uses aptitude tests, only one of 20 people selected for programmer training during the last four years did not complete the program, and that person dropped out for personal reasons. According to Sandra J. King, automated system development training manager for Shawmut, "the key is which test you use."

The test with which King is most familiar is from Wolfe Computer Aptitude Testing, Ltd. in Oradell, N.J. That test takes up to 5½ hours to complete and basically simulates the way a person works at a job. The person being tested can even deduct time for breaks.

The Wolfe test results are evaluated by the testing agency, which provides a percentage score as well as a written narrative. "For example, it would say that Johnny Jones performed successfully by doing X number of things. But he did it very slowly or made several careless mistakes. However, the mistakes were of the

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NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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SPECIAL REPORT

Inside:
I/O: Preparing For Tomorrow Today

Burroughs Guilty of Fraud In Suit Filed by B800 User

By Jim Bartimo
CW Staff

CASPER, Wyo. — Burroughs Corp. was ordered last week to pay $154,000 to a user of its B800 computer system after a federal District Court jury here found the vendor guilty of fraud and breach of warranty. The user, Industrial Distributors, Inc., had sought $800,000 in damages.

A Burroughs spokesman said the company will appeal the court's finding of fraud.

During last week's trial, Robert Wagner, an expert witness brought in by Industrial Distributors, testified that the user's minicomputer is "incapable of handling multiple programs at the same time," as Burroughs claimed it would. Industrial Distributors also attempted to prove that the system displayed "extraordinary mechanical problems," according to the user's attorney, Marvin Benn of Hamman, Benn and Miller, a Chicago law firm.

Benn said Wagner also told the court that the computer experienced 51 "clean starts," causing a program being run to be wiped out and started again.

Industrial Distributors "needed the computer for order processing and inventory control," Benn said, but encountered difficulty in using the machine to run multiple programs. Industrial Distributors is still paying a third party for the machine — financed through a local bank — but is no longer using it. The company now uses an IBM System/38.

Benn will argue a similar case against Burroughs early next month. His law firm currently represents more than 60 other users of Burroughs B700, B800 and B80 systems who have filed lawsuits against the vendor.

One of those cases, expected to go to trial as early as next February, has been filed by Quality Books, Inc., which two years ago placed an advertisement in the *Wall Street Journal* seeking other dissatisfied Burroughs users. A year and a half later, Burroughs found itself facing more than

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AT&T Files Revised BPSS Tariff

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — AT&T last week filed a revised tariff for the Bell Packet Switching Service, the underlying transmission network for the computer-based services it plans to offer.

The revised tariff allows the sharing of BPSS switches. The original version of the tariff, rejected by the Federal Communications Commission last August, required the user to lease an entire BPSS switch.

FCC commissioners felt the only customer able to lease an entire switch would be American Bell, Inc., AT&T's separate subsidiary. The phone company said last week that it has "identified a second major potential customer for BPSS," and this customer's demand has been reflected in the proposed charges.

AT&T originally proposed charging one price for Dataphone Digital Service access circuits terminating at a BPSS switch and a higher price for the same circuits terminating at a competitor's packet switch. Competitors said this was discriminatory.

The two-price scheme has been eliminated in the new tariff as an "interim solution," AT&T said. However, the company plans to file revisions to the DDS tariff next month that will attempt to show the original pricing structure is justified on the

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Top Jobs 'Few and Far Between'

Recruiters Advise MIS Execs to Stay Put

By Bob Johnson
CW New York Bureau

NEW YORK — Management information systems professionals who are considering job changes should think twice. Top positions are few and far between.

That was the message from executive recruiters in the New York metropolitan area contacted recently by *Computerworld*.

The lack of high-level openings has more to do with the economy than with the state of the DP industry, according to Robert Stanton, vice-president of Management Scientists, Inc. "Many people think of DP as being recession-proof, but in fact it is not. Many companies are not hiring MIS executives so readily and the DPers themselves are being noticeably impacted, especially in the small to medium-size companies," he said.

Stanton sees no increase during the next three to six months in the turnover rate of DPers in the $60,000 to $100,000 salary range unless there is a dramatic turnaround in the economy. Most executives are staying with their current jobs, and companies are "playing it closer to the

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Paid for Phony DP Services

NASD Exec Says 'Guilty' to Scam

By Susan Blakeney
CW Staff

WASHINGTON, D.C. — The former vice-president of system network services for the National Association of Securities Dealers, Inc. (NASD) pleaded guilty to mail fraud charges earlier this month after admitting he tricked NASD into paying $45,000 for nonexistent computer services and then pocketed the money himself.

According to documents filed here in U.S. District Court, John Lewis DeCaro, 42, established a bogus company called System Design Group (SDG) in September 1981 and paid a nearby college student $10 an hour to act as president. The following month, DeCaro contracted with SDG to design computer software programs for NASD.

DeCaro instructed the college student to bill NASD by using time sheets attributed to fictitious SDG employees. SDG invoices sent to NASD were approved for payment by DeCaro, who was in charge of the NASD computer systems used for internal budgeting, administration and maintenance of the organization's national list of individuals employed in the securities industry.

SDG deposited NASD's payments, then drew checks payable to two fictitious employees. Those checks were later endorsed by DeCaro and deposited in his personal account.

Scheme Discovered

This routine continued until last March, when the scheme was discovered by the NASD treasurer's office. The treasurer's office "wanted more documentation," said Gordon Macklin, NASD president. "They needed some justification for what was being paid out" because no software had yet been delivered, nor did any appear to be forthcoming. An internal NASD investigation unearthed DeCaro's affiliation with SDG.

John Flood, a senior attorney with NASD, said DeCaro's employment was terminated April 22. "Since that time, the association has been cooperating with the FBI and the U.S. Attorney's office in the investigation of this matter," Flood said.

DeCaro is scheduled to be sentenced Dec. 13 by Judge Thomas Flannery in the U.S. District Court of the District of Columbia. He faces a $1,000 fine and/or up to five years in jail for the federal criminal offense.

Defending attorney John Kotelly will request that Flannery place DeCaro on probation. "It's the first time he's ever been in trouble . . . and he intends to make full restitution," Kotelly remarked.

Meanwhile, NASD has filed with its insurance company to recoup the missing money and Macklin "fully expects recovery."

DP Answers Valley Girls: 'Gag Me With a Microchip'

Look out Intel, here he comes,
He's the king of computer runs.
Got his degree from MIT,
Knows square roots to infinity.

GILROY, Calif. — If you haven't already gagged on Valleyitis, get ready for the male version of Frank Zappa's ode to *Valley Girls*, the song that described pubescent San Fernando Valley girls and their shopping-mall mentalities.

A new recording called *Silicon Valley Guy* immortalizes a teenage boy of the same region as a bespectacled, obsessive computer freak whose vocabulary is just as esoteric as that of his female counterpart. "Gag me with a microchip" means something is really gross; "Modem to the max" describes something really good.

Ray Fifo is the hero of *Silicon Valley Guy*, done by Don Data and the Rea-Tones, a newly formed group from Phoenix. Fifo dresses like a nerd and gets his kicks shopping at Radio Shack.

The song is enjoying a lot of air play at the off-beat radio station KFAT in Gilroy, Calif., where a spokeswoman said the record, which has not yet been released for general sale, is being requested by "lots of area Silicon Valley guys and gals."

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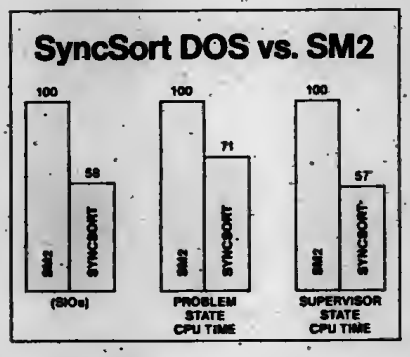

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- select relevant records;
- reformat records on output;
- insert character strings;
- convert numerical data to printable characters;
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If you'd like to make your sorts move quickly and economically, give us a call. We'll send over one of our systems engineers. He or she will prove to you the correctness of another Confucianism: "One demonstration worth a thousand words."

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Toyota Puts Brakes on Programmer Turnover

By Jeffry Beeler
CW West Coast Bureau

TORRANCE, Calif. — The main domestic data center for the U.S.' leading import car maker lost 26 of its approximately 100 programmers to turnover during the fiscal year that ended July 1.

Since then, however, the number of departing DP employees has shrunk to only one.

Robert Best, vice-president of data systems for Toyota Motor Sales U.S.A., Inc., attributes Toyota's sharp decrease in programmer turnover in part to the company's recent move into a new $20 million corporate data center, which is being touted as one of the most modern automotive computing facilities in the U.S.

From the terminals on its employees' desks to the wall coverings on the building's interior, Toyota "has gone to very great lengths to provide our [programmers and other DP personnel] with an attractive place to work," Best said.

First occupied July 1, the data center lies practically within shouting distance of Toyota's former U.S. computing department headquarters. But although the old and new sites are geographically cheek by jowl, they could hardly be farther apart in their facilities and amenities. In virtually all important respects, the current center represents a vast improvement over the installation it has replaced.

One of the new facility's main advantages over its predecessor is its size, according to Douglas Plescia, the corporate computing department's manager of technology and operations. Divided between the building's two main levels are approximately 70,000 sq ft of floor space, compared to only 44,000 sq ft at the previous location.

This substantial increase in work space has enabled Toyota to complement its existing 12M-byte IBM 3033 with a second such processor, both running under MVS/SP. The addition of a second central processor, in turn, has "significantly improved" the access times for the company's programmers and has "markedly increased" the organization's programming productivity, Best said.

"When we were still in our old data processing facility down the street, we had planned to start a 12-man-year development project as soon as our new fiscal year began in October," he recalled. "Because all our computing resources were committed to other long-range systems projects, we had originally thought we would have to subcontract the 12-man-year job out to an independent programming firm.

"But once we moved over to our new data center, our project leaders and managers noticed such an immediate and obvious improvement in productivity that we were able to cancel the outside arrangement and do the development job in-house."

The increase in floor space has further streamlined Toyota's domestic computing operations by easing the DP department's once-serious overcrowding problem. At the old installation, the shortage of work space became so acute that as many as four programmers were forced to share a single office.

Individual Workstations

Today, each employee has his own individual workstation with personal storage cabinets, ergonomically designed office furniture and dedicated IBM 3278 CRT terminals, which provide on-line access to the dual 3033s.

But the center's material amenities extend far beyond the employees' individual work areas. After a hard day of writing code under IBM's TSO, tired programmers can retire to the center's locker room, change into their jogging clothes and unwind with a few brisk laps around Toyota's private running track. Later, employees can relax and wash away the sweat in their own personal shower rooms.

The data center also houses several private meeting areas, which Toyota personnel can reserve for conferences and other special occasions including employee birthday parties, Best said.

"One of the things that separates us from other data processing facilities is the extent and quality of our amenities," he added. "We advertise those kinds of features in our cars, and now we're trying to do the same thing with our computing department. We want to bring to our data center a level of quality that we hope makes us No. 1 in that area as well as No. 1 in the import car business."

CW Photos by J. Beeler

The Control Room of Toyota's Los Angeles DP Center

New Center the Hub of an 8100 Network

TORRANCE, Calif. — Run by a full-time staff consisting of about 190 managers and other computing professionals, Toyota Motor Sales U.S.A., Inc.'s new data center here serves as the hub of a nationwide distributed processing network that encompasses nine regional headquarters offices and the corporate center. Each of these "nodes" houses an IBM 8100 that transmits its data each night over leased 9,600 bit/sec communications lines to the corporate facility's central control room.

The installation here also serves as the central data collection point for Toyota's network of some 700 U.S. auto dealerships, about 500 of which have already been equipped with a variety of IBM minicomputers, including 5285s, 5288s and System/34s. With the help of the remote minis, dealers can collect information such as vehicle and parts reports, financial statements, sales figures and warranty claims and then transmit those items back to Toyota's two 3033 host processors.

Among its other highlights, the data center features a satellite communications link with Toyota's world headquarters in Tokyo, a dealer demonstration room outfitted with IBM 5280 series hardware and a "help" desk for the development and debugging of dealer software.

A Programmer Workstation at the Toyota Center

The Data Center's User Help Area

Gives Flexibility to System Planners

System Lets Users Link, Share Decsystem-20s

By Susan Blakeney
CW Staff

MARLBORO, Mass. — Digital Equipment Corp. last week unveiled a system said to allow users of its large-scale processors to link and share CPU and storage resources. The system is initially targeted for Decsystem-20 mainframes, but will eventually be available for VAX-11 superminis and PDP-11 minicomputers, as well as DEC's personal computer line.

The Advanced System Interconnect Structure was developed to give system planners a high degree of flexibility in building and expanding computer resources, DEC said. By giving users access to shared computers and mass storage, user productivity improves and the reliability of data files is increased.

The Advanced System Interconnect Structure is targeted for installations in business, engineering, science, data services and education, as well as for any other installation with large I/O requirements.

It provides shared processor and storage resources via a newly devised high-speed bus and shared mass storage controllers, DEC said. Data access is transparent to the user, who can work from a terminal without encountering the delays and file duplication of conventional networks, the DEC spokesman said.

The structure also provides users with remote capability through Decnet and local-area networking via Xerox Corp.'s Ethernet.

Hardware Components

The hardware components that comprise the Advanced System Interconnect Structure include DEC's Computer Interconnect (CI) bus, the HSC50 intelligent mass storage server and the TA78 storsge subsystem.

The CI bus is an external bus that reportedly enables processors and servers to communicate at speeds up to 70M bit/sec. It provides a level of standardization that reduces the complexity and cost of system expansion and modification, DEC claimed.

The HSC50 connects multiple storage devices to multiple processors. Up to four Decsystem-20 mainframes (Decsystem-20/40s, 20/60s or a combination) can be linked in a single configuration.

The HSC50 enables up to 24 storage peripherals to be accessed by multiple processors in a loosely coupled, multisystem implementation, the vendor said. This is accomplished by masking individual drive characteristics from a host computer so that all storsge devices are generic to the host's operating system, the spokesman explained.

The stand-alone server is connected to storage peripherals through either disk data channels or tape data channels. Up to four storage peripherals can be connected through each data channel.

In addition, the server reportedly handles all diagnostic and error-handling chores previously performed by the host processor.

Disks currently supported by the server are DEC's RA60, a 210M-byte removable-medium drive, and the RA81, a 463M-byte Winchester-type drive. The tape drive, the TA78, which has a 145M-byte capacity and uses a 6,250 bit/in. mode, is also supported by the HSC50.

Configuration prices for the interconnect structure range from $870,000 — for two Decsystem processors, software, three disk drives and a tape drive — up to $3.4 million for a full-fledged configuration. The bus adapter is priced at $19,500, while the HSC50 server costs $32,500 plus $7,100 for each disk or tape channel.

The TA78 tape subsystem costs $52,000, with add-on drives priced at $25,500.

Software for the interconnect structure consists of the Common File System-20 (CFS-20) multiprocessing package, priced at $85,000, which runs under DEC's Tops-20 operating system. This operating system will reportedly be extended to Phase IV of Decnet so that when the interconnect structure is released, the resulting Decnet-20 Phase IV will enable individual mainframe systems to be linked up to Ethernet.

The Advanced System Interconnect Structure is scheduled for general release in the fall of 1983. It will be demonstrated next week at the firm's Decus users group meeting in Anaheim, Calif.

Bell Adds Fellowship

CHARLOTTESVILLE, Va. — Bell Laborstories has announced a $2 million fellowship progrsm to support doctoral students in information technology fields.

Twenty-five fellowships will be grsnted each year. Each fellowship will last an average of four years or until the Ph.D. program is completed and will cover stipend, tuition, books, living and other expenses.

Bell said it will provide the opportunity for each fellow to work at a company location during the summer.

Anderson, here.

Oh, hello sir.

Hello Jim, this is Tom Roberts.

I've received your request for increased funding on the B.I.N.D.E.R. Project. What sort of delays are we talking about?

Well sir, we seem, ah, to be behind deadline . . .

I'm already aware of that, Jim.

Well, because the new system, ah, seems . . . to interface more . . . subtly with the . . . ah . . . existing software. We. . . .

How *much* more is this subtlety going to cost me this time, Jim?

Well it seems . . . ah . . . that our first . . . ah . . . calculations were. . . . ah . . . . . .

Way off base, Jim?

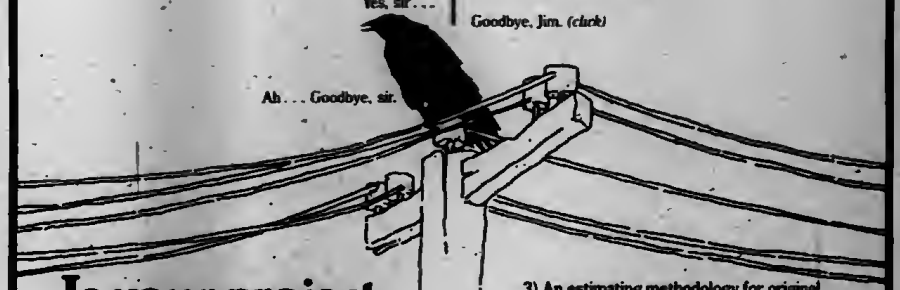
Ah. . . . well . . . a bit, sir.

I see.
Look Jim, this project is instrumental to the progress of our division. I'm going to be in town on Thursday and I'd like to talk with you about the B.I.N.D.E.R. Project and *your* future. Do we understand each other?

Yes, sir . . .

Goodbye, Jim. *(click)*

Ah . . . Goodbye, sir.



Is your project on the line?

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BRINGING PEOPLE INTO THE PROGRAM

IBM Adds, Drops Charges in Bridge Tech Case

By Bill Laberis
CW Staff

ARMONK, N.Y. — IBM has tacked new charges onto a complaint it filed in September against two former IBM employees accused of misappropriating proprietary information. At the same time, it withdrew charges against a third former IBM employee.

The latest accusations allege that Lewis C. Eggebrecht and Peter J. Stearns, former IBM senior engineers, served as paid consultants for a competitor while on the IBM payroll.

IBM claims the two violated their employment contracts when, beginning last April, they undertook consulting duties for Syntrex, Inc. of Eatontown, N.J. Syntrex wanted to develop a communications interface for the IBM System/34 and System/38, a Syntrex spokesman said.

In the original civil suit filed in New York Supreme Court, IBM charged that Eggebrecht and Stearns, along with William W. Erdman, intended to use IBM trade secrets related to the company's Personal Computer to design and market products for their own start-up venture, Bridge Technology, Inc. IBM has now settled with Erdman, who has consented to a permanent injunction prohibiting him from revealing IBM's trade secrets, the company said.

Erdman has also returned an undisclosed portion of his past salary and has agreed to make full disclosure to IBM about his relationship with Eggebrecht and Stearns. He has agreed to testify when and if the case goes to trial, IBM added.

In a telephone interview, James R. Folts, Syntrex vice-president of corporate development, said Stearns and Eggebrecht merely helped the company engineers wade through piles of publicly available IBM system manuals. "They were quite scrupulous about staying away from revealing anything of a proprietary nature," Folts said of the pair.

Stearns informally approached Syntrex officials earlier this year, claiming he was looking for investment capital for a new company he was planning, Folts added. Stearns had several "good friends" at Syntrex, Folts remarked, including people with whom Stearns had helped found a company called Interdata Co. in 1969, Folts said. Interdata later became the computer division of Perkin-Elmer Corp.

It was during a series of "friendly discussions" that the possibility of consulting for Syntrex arose, Folts continued. Stearns later introduced Eggebrecht, his co-worker at IBM and would-be partner in Bridge Technology, to the Syntrex people.

"It seemed to us like a reasonable alternative to running around for months interpreting the [IBM] manuals so we could build the interface," Folts said. Syntrex severed the consulting relationship with the two in July when it was discovered that the interface Syntrex wanted to design was available from two other vendors.

In published reports, William Greer, attorney for Eggebrecht and Stearns, denied IBM's charges, saying his clients performed the $4,500 consulting job while on vacation from IBM. Like Folts, Greer said the two helped interpret nonproprietary system manuals for Syntrex.

IBM has based much of its accusations on the work of its own security force, which reportedly taped several conversations between Erdman and a Cleveland firm to whom Erdman allegedly offered corporate secrets. IBM has said its charges are supported by an affidavit signed by the president of this Cleveland company.

No trial date has been set for the case.

Openings for MIS Execs Sparse, Recruiters Say

(Continued from Page 1)

vest" when thinking about hiring.

However, even though the job market is not flourishing, Stanton maintained that he would not discourage would-be job changers from looking around. Some jobs will be available, particularly in the Northeast, for DPers with a good mixture of heavy technical background and demonstrable interface skills with corporate upper management, according to Stanton.

Concurring with him was Joseph Sabrin, president of Data Executives, Ltd. Most high-level "No. 1" spots are filled, Sabrin said, but noted that those executives with data communications skills, on-line processing skills and office automation backgrounds have a much "better shot" at landing the few available jobs.

On the negative side, Sabrin stated that consolidations, mergers and acquisitions in the DP industry have pushed a lot of jobs out of the market. In addition, "there is not much turnover at these high levels. We have filled only two or three executive positions within the last six months, and I really don't see much improvement until late in 1984."

Sabrin pointed out that the lack of high-level DP jobs has had a trickle-down effect on middle management, causing much higher competition in these areas. MIS executives who were forced out of comfortable positions because of attrition or layoffs are sometimes willing to settle for a lower level job, he said.

Sabrin's advice to job seekers is to stay where they are unless they have desirable skills or are willing to relocate. "The Sun Belt will be the first area out of the recession," Sabrin predicted. "Traditionally, the more obscure the area, the more DP turnover activity, so MIS executives inclined to change may be wise to consider these areas."

James J. D'Amora, president of Technical Decisions, Inc., has a somewhat different view of the executive job market. His firm sees the situation from the perspective of its clients, which are primarily companies with vested interests in DP as a business.

"Firms that are using DP for profit, like a brokerage [house] making $20 million from on-line services, are the places for the job-seeking MIS executive to go," D'Amora said.

However, D'Amora said that in the classic IBM 370 mainframe environment, executive MIS movement will be slow.

AT&T Revises BPSS Tariff

(Continued from Page 1)

basis of differing costs.

Once the application filed last week is approved, the phone company said, it will submit a tariff on one day's notice, meaning that the rates would become effective one day after being accepted by the commission.

AT&T told the FCC that it plans to have the first BPSS switch operational in New York by the middle of next year. A total of eight access and trunk ports are expected to be in use by then.

By the end of 1983, a total of six BPSS switches should be on the air — one each in New York, Newark, N.J., Sacramento, Calif., and Chicago and two in Memphis, Tenn. — and nearly 430 ports will be operational, AT&T said.

End-to-End Transmission

BPSS supports end-to-end transmission at either 9,600 or 56K bit/sec between externally provided packetizing/depacketizing facilities. These may be resident in the terminals at the extremities of the message path or located within computer-based communications processors connected to BPSS but operated by others.

One BPSS operator will be American Bell. Others might be GTE Telenet Communications Corp. or Tymnet, Inc.

AT&T stressed that the new service provides only "transport" functions such as flow control, routing and intra-BPSS network error control. Under the terms of the FCC's Second Computer Inquiry decision, AT&T's Long Lines Division — the BPSS operator — cannot perform any protocol/code conversion functions.

However, competitors insist that, despite what the phone company says, BPSS violates this provision of the decision.

To establish a connection through the switch, the user needs at least two ports. For a 9,600 bit/sec port, AT&T proposed charging $550/mo plus a one-time $500 installation fee, according to an illustrative tariff accompanying last week's filing. For a 56K bit/sec port, the charges would be $1,200/mo and $500/mo, respectively.

In addition, there is a charge of $1.35 for each 1,000 packets transmitted, plus $.0068 for each virtual call request.

The phone company also wants to levy a $1,150/mo minimum-usage charge on each port. Charges for access circuits and interswitch trunks would be additional.

If a user wanted to reconfigure a particular channel, it would cost $225 to change one of the related software functions.

The tariff also states that a user who wants to terminate BPSS must provide 12 months' notice to the phone company.

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Senator, Honeywell Employees Guilty of Fraud

By Jim Bartimo
CW Staff

MEMPHIS, Tenn. — Tennessee state Sen. Edgar Hardin Gillock and two former Honeywell, Inc. employees were found guilty in U.S. District Court here this month on nine counts of fraud. The verdict came after a month-long trial on charges that the three defendants swindled more than $150,000 from Honeywell during the sale of two computers to the state of Tennessee.

The former Honeywell employees, A. Arthur Ayers and Allan Harvey Bibby, could each receive up to 45 years in prison when they are sentenced next month. Gillock — a Democrat who is still in office — could receive up to 75 years because he was also found guilty on two charges of tax evasion, according to prosecuting U.S. Attorney W. Hickman Ewing Jr.

Although only Bibby has started the appeal process, Gillock and Ayers are also expected to appeal the verdict.

According to the 30-page indictment in the case, third-party companies — some of which were owned by Honeywell employees — billed Honeywell for bogus services. The funds were divided among the defendants and used to pay Gillock for his influence with state and county officials [CW, July 26].

Honeywell Changes

Contacted last week for a comment on the outcome of the case, a spokesman for Honeywell said, "The jury verdict speaks for itself, and therefore, there is no point in commenting further."

However, acting upon "a normal review of business practices, Honeywell has made a number of organization and procedural changes in respect to the manner in which third-party financing transactions are handled," the spokesman added. These transactions are now being handled by Honeywell to avoid further irregular business conduct, he said.

Ten other former Honeywell employees were mentioned in the indictment, many of whom testified against the defendants. Oliver Drew, Jack Owen, Robert Grapp and one other former Honeywell employee received "testimonial immunity," allowing them to submit testimony that cannot be used against them in future proceedings, Ewing said.

According to the indictment, the Honeywell employees had been trying for more than a year during 1975 and 1976 to sell the state a computer system for its Department of Employment Security. Owen and Bibby used $4,000 in bogus, third-party billings to buy Gillock's influence in the executive and legislative branches of state government, the jury found.

In October 1976, the state awarded a $2.5 million contract to Honeywell for the department's system. "Thereafter, Gillock agreed to assist Honeywell from time to time in getting state business," the indictment said. Gillock was found to have influenced Roy Nixon, then the mayor of Shelby County, in the purchase of an upgrade to the Honeywell 66/40 mainframe for the Shelby County Data Center. Gillock received six monthly payments of $3,000 each, according to the jury.

The verdict found that approximately $150,000 that would have gone to Honeywell was diverted by the former employees through bogus discounting and billings of Honeywell services.

All three defendants had pleaded innocent to the charges.

Years of Investigation, A Landmark Ruling

MEMPHIS, Tenn. — Last week's conviction of Tennessee state Sen. Edgar Hardin Gillock culminated several years of investigations, indictments and prosecutions that led to a landmark U.S. Supreme Court decision.

Gillock's involvement with the Honeywell, Inc. employees who were found guilty last week of selling bogus computer services to the state of Tennessee was discovered during investigations surrounding a 1976 indictment. That indictment charged Gillock with one count of racketeering and five counts of extortion in actions that were said to have taken place in 1972.

Contending that statements made on the state Senate floor were protected by "speech and debate" privileges, Gillock argued in a number of courts that he could not be charged with influence peddling that may have taken place on the Senate floor. Finally, in 1980, the U.S. Supreme Court ruled that a state legislator could not use the speech and debate privilege in a federal prosecution.

The Gillock case was sent back to the lower court for trial. Two trials ended in hung juries, and the charges were eventually dismissed. However, evidence uncovered during these trials led to this month's conviction on different charges.

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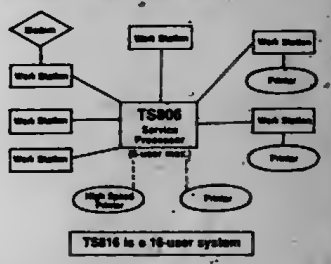

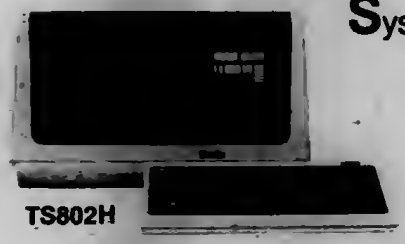

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NATIONAL COMPUTER

Users Say Aptitude Testing Worth the Risks

(Continued from Page 1)

type that would be picked up during compilation of the programs,' " King explained. "So [job applicants] are being tested on how well they read, interpret and execute whatever they have been asked to do.

"It is very similar to what they would do in a programming atmosphere but, at the same time, they don't have to have programming experience or knowledge to work on a test."

Shawmut has not used the Wolfe test extensively enough to be required to validate it, but King did consult the bank's legal department when the test was being considered for Shawmut use. In hiring, "it seems you are actually safer by establishing fixed criteria and then recording all of your activities," King said. However, she added, "fortunately, we have had enough minority candidates complete the test successfully and then perform well afterwards, so we have not been faced with that issue."

One of King's "biggest bones of contention with regard to aptitude tests" is that some inappropriate ones are used because they are inexpensive. "I don't believe they are aptitude tests. I think they are intelligence tests." The Wolfe tests and the Berger Aptitude for Programming Test are "ones I consider aptitude tests."

Negative Comments

Several people interviewed by *Computerworld* made negative comments about the Computer Programmer Aptitude Battery distributed by Science Research Associates, Inc. (SRA), an IBM subsidiary. The John Hancock Mutual Life Insurance Co. in Boston, however, has had much success with the SRA test since it began using it in 1972. The insurer is currently making a study of the test.

Looking at just one part of the test, Marlene Goldberg, manager of personnel research, said, "if someone scores average or above, they have a nine-in-10 chance of completing the [programmer] training. If they score below average on this part of the test, they only have a one-in-two chance of completing the training.

"In the early '70s," Goldberg recalled, "we went for a brief period of time without using the test at all. Our failure rate was that approximately half the class dropped out. Now over 90% complete the training."

Only three of 80 trainees did not complete the program this year. "We have found that once they complete the training, the test is also predictive of subsequent job performance."

Success Ratio

Ronald Claise, manager of information systems training at Parker Brothers, Inc. in Beverly, Mass., uses the Wolfe test. He previously used the Berger Test for more than seven years at Liberty Mutual Insurance Co. "My success ratio has been basically about 95%," he said of using aptitude tests. "Given a nondiscriminated population, it probably would be about 50%."

Many of those interviewed stressed that testing is only part of the screening procedure. "A test will predict how well a person will learn how to program. It is not going to predict other variables like motivation and communication skills, which are important for a programmer," Goldberg pointed out. These interpersonal skills, she said, will show up in other performance tests and interviews.

Aptitude Test Validation Costly Process, Consultant Says

Validating an aptitude test to meet Equal Opportunity Employment Commission standards is a costly and extensive process, according to Bradley W. Nelson, an independent consultant in Renton, Wash.

"If you want to use testing, it would have to be validated for the particular group of people you would be selecting from — your audience," according to Nelson. Validation involves "a lot of potential headaches."

The validation procedure generally is conducted by an outside individual or consultant, Nelson explained. The firm that is hiring puts together a job description of the position for which it wants to select and train people. It then runs applicants for the program through an aptitude test and records their scores. The applicants are also interviewed. Selection is based on a combination of their background, the interview and the test results.

In order to "validate" the test, the employer then has to track the performance of those selected for the job through the training process and in the job itself.

"Where the whole thing breaks down a little bit is the fact that to do a really good statistical analysis, you should have a cross-selection of people from the different groups," Nelson said. This involves running people through the program who the company thinks will fail or have problems.

The usual selection process, however, involves choosing the best qualified applicants. Therefore, when a correlation or statistical analysis of test scores and results of the training program is completed, the firm naturally finds that the test is a good predictor of success in the program.

"Just taking people and sending them through a program without selection can really cause you problems," Nelson said.

For a firm facing a class action suit, the fact that it has used an established aptitude test may help, even if this test has not been validated, Nelson said. Although it "really doesn't pave the way through the courts for you," it provides some substance, according to Nelson. "If you developed your own test, you would have nothing to stand on. There is really a much greater risk."

'You Bet Your Bippy'

Can the use of testing as a screening method for entry-level programmers help a company save DP training money?

"You bet your bippy" was the amused response of Shawmut Bank of Boston's Sandra King, automated system development training manager for the institution. King feels that testing should go beyond the entry level to evaluate the proficiency of experienced programmers.

Independent consultant Bradley Nelson said the use of aptitude tests often depends on the size of the training program the firm is running. "I think when you are talking about big bucks and you are really concerned about the potential of that program, people are going to turn to something like the Berger test or the Wolfe test."

More Than Money

More than saving money, however, testing can save time and effort for both employers and potential employees. "If we don't have anything like this, we'll hire the people and put them in the entry-level course and they will fail. It is no good for them and no good for us," observed Bob Bolante, second vice-president of corporate education at John Hancock Mutual Life Insurance Co.

Nelson believes the employee has more to lose than the employer. The employer invests dollars in a training program, but the employee invests time and a lot of personal commitment: "If the person doesn't succeed, it is really a downer for him."

Nelson described a situation in which a person is accepted into a programmer trainee program and tells relatives and friends he is going to be a programmer. When he fails, he loses face.

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Burroughs Guilty of Fraud

(Continued from Page 1)

150 lawsuits concerning its minicomputers.

According to Tom Drewes, president of Quality Books, "Our case is absolutely a lead-pipe cinch. My counsel advises me that our case is very sound."

Quality Books now uses a system from Wang Laboratories, Inc., but still owns its B800, which currently is unused.

A Burroughs spokesman said last week that the outcome of the Industrial Distributors case "is not going to affect our procedures" In dealing with users who are suing the corporation. "We prefer to work out an arrangement without going to court, but sometimes there is no alternative. We have to work these things out on a case-by-case basis."

Burroughs has been ordered to pay Industrial Distributors the $154,000 within 30 days unless it files an appeal, Benn said. Industrial Distributors will keep the $97,000 computer in addition to the money awarded by the jury.

The Burroughs spokesman, who said the company would appeal the verdict, noted that "in a similar case in Alabama, the case was overturned.

"We were satisfied that the jury verdict was less that half of the original amount," he added, but "regret that it couldn't be settled out of court."

But Membership Growth Slows

DP Trade Groups Healthy Despite Recession

By Bruce Hoard
CW Staff

Despite hard economic times, most DP trade associations contacted by *Computerworld* last week reported that they are weathering the recession in good health.

Asked if the recession has held down the Data Processing Management Association's (DPMA) membership numbers, Janet L. Milakis, DPMA membership manager replied, "It could be better. Maybe the recession has diminished it a little bit."

As of Oct. 31, DPMA membership totaled 30,486 — the most ever — and Milakis said the organization was growing at an annual rate of between 8% and 11%. The DPMA charges members of its 274 chapters $55 for dues each year. Student memberships cost $12.

The 1983 fiscal year budget has been set at $2.7 million, up from a 1982 figure of $2.3 million, she said, adding that about 45% of the organization's income comes from membership dues and the other 55% from conferences and publications. The DPMA maintains a staff of 25, which has been slowly increasing, Milakis reported.

The DPMA is located at 505 Busse Highway, Park Ridge, Ill. 60068.

Negative Impact

John McKegney, deputy executive director of the Association for Computing Machinery (ACM), acknowledged the negative impact of the recession.

"Yes, I think our membership has been affected by the recession and inflation in the past two years," he said.

In January 1981, the ACM raised its membership dues from $28 to $40, the first such increase in eight years, according to McKegney.

Despite that, the organization has more members than ever at approximately 60,000, and the annual growth rate is holding steady at around 8%, McKegney said. ACM's budget for fiscal year 1983 is $8 million, up considerably from $6.5 million last year.

In addition to regular memberships, there are student memberships costing $13, educational institution memberships at $600 and corporate memberships that range between $750 and $7,500, depending on company size. There are about 300 educational institution members and "around 20" corporate members, he noted.

ACM takes in other revenue through subscription fees from its various publications, sold both to members and nonmembers (primarily libraries). It also earns money from meetings and conferences.

ACM is located at 1133 Ave. of the Americas, New York, N.Y. 10036.

Attendence Picking Up

The EDP Auditor's Association is much smaller than either the DPMA or ACM, with approximately 6,000 members, but attendance has recovered from a slump and "appears to be picking up," according to President Ingrid Oveson.

"We have felt the crunch like everybody else," she said. In order to counter it, the group is trying to offer more local courses that cut down on travel expenses.

The 1982 budget was $350,000 and Oveson said she thought that figure would be reduced slightly for 1983 — not as a concession to hard economic times but because the organization has found more cost-efficient ways of existing.

A membership costs $40 and there is also a charge of between $5 and $10 for each of the 63 chapters. Annual membership growth is approximately 10% to 12% and the association brings in extra money through its publications and conferences. She said one new staff person has recently been added.

The EDP Auditor's Assocation is located at 373 Schmale Road, Carol Stream, Ill. 60187.

ACU Membership Down

In contrast, things do not seem to be going quite so well for the Association of Computer Users (ACU). President Hillel Segal refused to divulge membership numbers, but did admit the organization had "lost a whole bunch" of members in the past year. He also said the staff has been cut back and publication of the *Interactive Computing Newsletter* temporarily halted.

"We've had some difficulties," Segal said. He pointed out that association memberships are a "discretionary expense" that get cut first when a corporation's budget is strained.

An ACU membership costs $65/year, and he said membership dues are the primary source of the organization's income.

The 1981 "National Trade & Professional Associations" guide attributes the organization with 4,000 members from 35 companies. It lists the ACU budget at between $250,000 and $500,000.

The ACU is located at Box 9003, Boulder, Colo. 80301.

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IRS Will Be Playing 'Dialing for Dollars' in '84

By Paul Gillin
CW Staff

WASHINGTON, D.C. — When the Internal Revenue Service's collection agents let their fingers do the walking in 1984, it is more likely to be across a terminal keyboard than a telephone dial.

The agency plans over the next two years to automate its nationwide telephone tax collection or dunning system, which has long been used to contact seriously delinquent taxpayers. Testing will begin at six district offices in May; full automation at 20 sites around the country is targeted for Sept. 30, 1984.

The IRS hopes the automation will hike collection efficiency by 15% and put a dent into the estimated $7 billion in seriously delinquent taxes that were owed as of Sept. 30. IRS spokesman Ernest Acosta said tax delinquency has nearly doubled in the last two years, forcing the agency to computerize and hire more staff in order to keep up. About two million citizens who have ignored four written notices are now subject to the telephone contact, Acosta said.

Each tax collector will have a terminal and a telephone connected to a host computer. The computer will dial the taxpayer's phone number automatically (and even redial the call if the line is busy) and display relevant account information on the terminal screen. An interactive feature will enable the collector to revise files as necessary, adding bank account numbers, payment schedules and other information.

Generating Dunning Data

Data for the dunning will be generated at the IRS' 10 major regional offices across the country and sent on magnetic tape to the 20 district offices. The IRS also maintains a national computer center in Martinsburg, W. Va., which keeps all the previous year's tax records. Data collected during the telephone dunning will be stored on tape and shipped back to the regional offices for merging onto the master files.

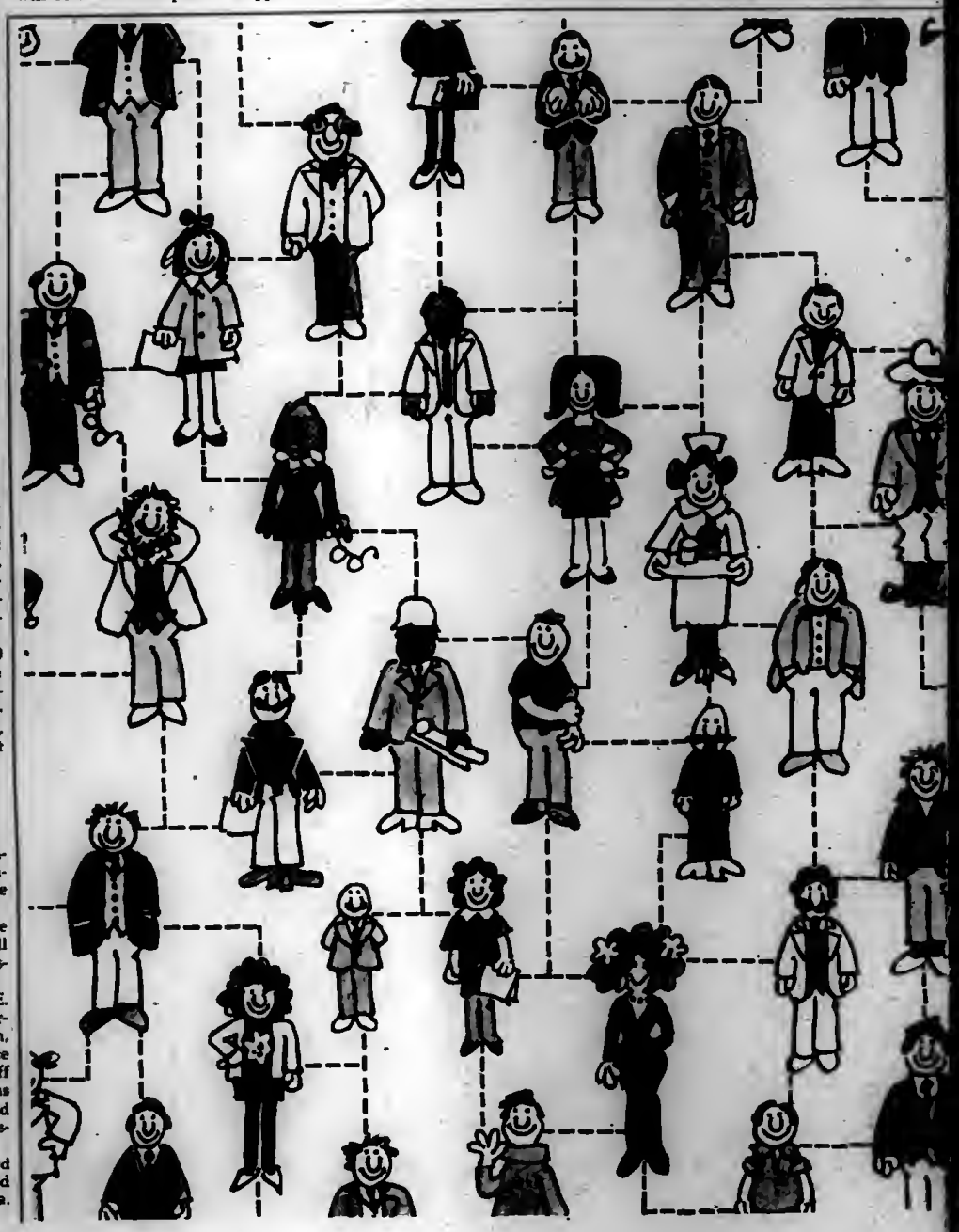
Tax collection is one function of the federal government that has been minimally affected by Reaganomics. The IRS expects to add 4,000 tax collectors to its payroll within the next year to handle the recent increase in delinquent taxes, Acosta said. Computerization is expected to create 300 to 350 technical jobs within the next two years.

When fully installed, the automated telephone system will enable the agency to cut 865 full-time jobs by 1985, the IRS estimated. Most of the affected employees will be offered alternative assignments within the district offices, Acosta said.

The systems to be tested in the Chicago and St. Louis district offices and in the Kansas City, Kan., Service Center will be comprised of IBM processors combined with Rockwell International, Inc. telephone equipment. Acosta could not say what model of IBM equipment will be benchmarked.

Test sites for a Sperry Univac 1100/60 tied to an ITT TD 250/500 telephone system include Nashville and Memphis, Tenn., and Indianapolis.

Other sites to be automated eventually include San Francisco; Los Angeles; New York; Newark, N.J.; Atlanta; Jacksonville, Fla.; Dallas; Houston; Philadelphia; Baltimore; Seattle; Denver; Buffalo, N.Y.; Cleveland; and Detroit.



Video Course Covers Software

FORT COLLINS, Colo. — A videotaped course designed for those involved in the development and maintenance of software products has been announced here by Colorado State University.

"Software Engineering" consists of 20 30-minute lectures covering modern techniques of software analysis, design, coding, testing and maintenance. The tapes are in color, and the lectures cover the tools, techniques and notations useful on projects of all sizes and in all applications areas, the school claimed.

Course tapes are priced at $6,350 for the complete set or at $1,615 on a four-week lease basis, from the Engineering Renewal and Growth Program, Colorado State University, Christman Field, Building 1000, Fort Collins, Colo. 80523.

AT&T Settlement Focus of May Meet

WASHINGTON, D.C. — Telestrategies, Inc. will hold a conference entitled "The AT&T Settlement" here May 20-21.

The conference will focus on the impact the AT&T divestiture will have on the communications industry.

Speakers will include Richard E. Wiley, former chairman of the Federal Communications Commission, Richard Neustadt, former associate director of the Domestic Policy Staff in charge of telecommunications during the Carter administration and Jerome G. Lucas, president of Telestrategies, among others.

The registration fee is $650, and Telestrategies can be reached through P.O. Box 874, McLean, Va. 22101.

By National Academy of Sciences

Scientific Exchanges Urged Between U.S., Japan

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Because of the rapidly growing importance of Japanese computer science, the U.S. government should more actively support scientific exchanges between the two countries and sponsor translation of Japanese journals, a special National Academy of Sciences (NAS) panel said recently.

In the Japan section of its report on international developments in computer science, the academy group said that although much information on Japanese research is available in English, it is not readily accessible to most U.S. computer scientists.

"A program should be established to send selected Japanese-speaking computer scientists in this country to Japan as guest workers," the report stated. "An intensive language program for a few specialists who do not speak Japanese could be included," possibly financed by the Association for Computing Machinery, the American Federation of Information Processing Societies, Inc. or the U.S. government, the panel added.

The academy also suggested that academic centers of expertise on Japanese computing be established with government funding in the U.S. or in Japan to review and analyze Japanese activities. In addition, the government should sponsor continued translation of selected Japanese journals, theses and books, the panel said.

The NAS panel, chaired by Dr. Carl Hammer, former Sperry Univac director of computer science, also looked at developments in the field in Western Europe, Eastern Europe and the USSR, Latin America and the People's Republic of China.

Stating that "the U.S. can no longer afford to ignore the fact that many nations will sooner or later match or even surpass our expertise in computer science," the panel found that "many U.S. computer scientists are not aware ... of developments in computer science abroad." Language barriers were blamed for most of this problem.

While developments in Western Europe receive considerable U.S. attention because English is the language most often used for disseminating that information, the report said more attention must be paid to Japanese science and to work done in Eastern Europe, where "some of the analytical approaches to problems appear to be novel and advanced."

While not advocating a concerted program to make Russian and Eastern European data available to the U.S., the panel did recommend alerting American scientists "to the fact that they probably underuse Soviet computer science material [already] available in English."

Similarly, the NAS report said Latin American and Chinese computer science do not warrant special attention at this time, but American scientists should be aware that both are developing centers of expertise that will sooner or later deserve U.S. scrutiny.

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Course Targets MFT/MVT

BELLEVUE, Wash. — Is anyone out there still using IBM's MFT/MVT operating system?

If so, Software Information Services (SIS) here has a course for you entitled, appropriately enough, "MFT/MVT Operating System." The course includes a 350-page student textbook, a stand-alone storage dump to illustrate the operating system's internal structures and a training workshop. It runs for 10 days and is said to cover all of the major internal components of OS.

SIS intends to hold the course at a central location that is agreeable to all participants. The firm hopes that one installation will agree to act as a host for the course, providing classroom facilities and computer access. This will allow the students to run jobs to access system components.

If 12 to 14 people sign up for the course, the cost will be $795/student, according to SIS. If classroom facilities must be rented, the cost will increase to cover this extra expense, a spokesman said.

Further information can be obtained from Software Information Services, P.O. Box 4132, Bellevue, Wash. 98009.

Guide Details Teletex

LONDON — The *Manager's Guide to Teletex*, published by the Eurodata Foundation, is the first in a series of guides on telecommunications topics geared toward managers with limited technical knowledge.

The guide covers teletex in outline; the office, text communications and teletex; teletex in relation to alternatives; network alternatives; and in-house teletex.

The guide costs $22 from the foundation at Broad Street House, 55 Old Broad St., London, EC2M 1RX.

Ride-Sharing Organization's Home Micro Hooked Into Bank's IBM 3083 Mainframe

By Bruce Hoard
CW Staff

HARTFORD, Conn. — Rush-hour traffic around this city moves a little faster each day because one man sitting at home with a $300 personal computer system is hooked up to an IBM 3083 downtown.

Bernie Dubbs is the man and a Commodore Business Machines, Inc. VIC-20 is the personal computer. Access to the 3083 is provided gratis by the Connecticut National Bank to Dubbs, data management coordinator for a nonprofit organization called Rideshare Co. Rideshare matches members of its data base of about 5,300 commuters who want to form car pools in the Greater Hartford area.

Like a lot of other programmers and systems analysts, Dubbs, formerly a programmer/analyst with Aetna Life and Casualty Co., likes working at home and during hours other than nine to five. He also likes the idea of conserving gasoline. "The ultimate conservation of gasoline is not using it at all," he says.

Home Connection

About three months ago, after he got permission from Rideshare to work at home, Dubbs went to Gary Durost, vice-president in charge of the Operational Services Group at Connecticut National, with a proposal. He would tap into the 3083 from home and the bank would perform a commendable public service.

Dubbs brought along the VIC-20 to demonstrate how easily it could be tied to the mainframe. Getting it to the bank was no problem because all it consists of is a keyboard and modem, which can be bought together for less than $300. Dubbs left the color television he uses for a CRT screen at home.

In less than an hour, the personal computer was logged on to IBM's TSO on the 3083 and able to develop and execute programs as if it was an IBM 3270-type terminal. "I can do anything the TSO line editor can do," Dubbs said. "For under $300, I had an intelligent terminal up and running and able to access a mainframe, and it was very, very simple."

"From a technical point of view, it was no problem," Durost noted. "The problem was: Would it be a corporate commitment?"

In other words, would Rideshare have to pay? Senior management at the bank decided the answer was no.

Connecticut National is watching the personal computer experiment with more than passing interest. Although the 105-branch bank currently does not use any personal computers, a pilot program employing IBM Displaywriters with IBM's CICS teleprocessing monitor is under way and could lead to increased personal computer use.

Dubbs still spends about half his time in the office working on an IBM 3276 terminal because such tasks as data entry are not easily done by one person working alone. "Working at home has not affected my productivity one way or the other," he maintained.

Science Group Changes Agenda

CHICAGO — The American Association for the Advancement of Science has announced a schedule change for its First Annual Conference on Computers in Science that was to be held here at the Conrad Hilton Hotel from Dec. 6-9.

The tutorials that were to be held Dec. 6 have been cancelled.

The remainder of the conference will take place as scheduled from Tues., Dec. 7 through Thurs., Dec. 9, an association spokesman said.

More information on the conference can be obtained from the American Association for the Advancement of Science located at 1515 Massachusetts Ave. N.W., Washington, D.C. 20005.

APL Conference Set for April

ROCKVILLE, Md. — The 1983 APL Conference and Exhibition will be held April 10-13 in Washington, D.C., under the sponsorship of the Association for Computing Machinery (ACM) and its Special Interest Group for APL (Sigapl).

The goal of this year's program is to provide a balance between theory and practical uses of APL, according to the conference sponsors. The program will include tutorials, the presentation of technical papers, more than 50 exhibits and the participation of leaders in the APL field.

Both contributed and invited papers will discuss practical experiences and state-of-the-art advances.

For ACM and Sigapl members, the registration fee is $145 before Feb. 15, $170 up to and including April 8 and $190 on-site. For nonmembers, the fee will be $170 before Feb. 15, $195 up to and including April 8 and $215 on-site. Reduced fees are available for students.

Further information can be obtained from the conference's General Chairman, Don Link, at STSC, Inc., 2115 E. Jefferson St., Rockville, Md. 20852.

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Planning Said Key to DOS-to-MVS Conversions

By Lois Paul
CW Staff

CAMBRIDGE, Mass. — Spend the time up front to do thorough planning. Keep the conversion process itself as short as possible. Convert your installation — not just your files and programs.

This advice for DP managers facing an IBM DOS-to-MVS conversion came from Dean Bouloukos, a principal with Peat, Marwick, Mitchell and Co. in Detroit, at a Peat Marwick seminar here last week.

"If you want the operating system conversion to be as short and have as little risk as possible, there is a lot of planning up front," Bouloukos said. And "you have to look for a short time frame conversion. It should never go more than a year. If you can't finish it in a year, you shouldn't really go into it."

One of the most dangerous conversion phenomena Bouloukos said he has seen is a focus on conversion of files and programs to MVS, rather than on the conversion of the installation. Sites with this attitude "are still running in a DOS mentality."

Bouloukos stressed the need for standards and procedures for the operations area. "If you do not have these under DOS, you probably will be OK. But you will need standards and procedures under MVS," he said.

In addition, "someone in the installation must understand what MVS does to the files" or you can "pollute an MVS environment very quickly." MVS is a sensitive operating system that requires disk and tape management, Bouloukos said. "If you are going to go into MVS, do not go in with manual disk management," he added, suggesting the use of packaged tape and disk managers.

Bouloukos advised DP managers converting to MVS to "make sure you understand what MVS is going to do for you and to you. It is an excellent operating system, but it has certain quirks."

Training DOS programmers on MVS is essential if they are going to install the new operating system, he said. Emphasizing the need for MVS talent, he projected that it would take several people who know MVS 10 to 12 weeks to get a full operating system installed after the IBM MVS Starter System is in place.

Bouloukos noted that tuning is an issue that is virtually unseen in a conversion plan, yet it is a must for MVS. "Users deal with getting the technology up. They do not deal with the real world, testing and converting the whole installation."

Full Support a Must

Another must, according to Bouloukos, is full support from senior management. One place this is necessary is in the enforcement of "freeze dates" on system development so that users understand that development really will cease during that period of time.

The first step in a good conversion plan is to study the conversion direction and policy, he said. This should include selection of the appearance of the environment, including how the work flow will be handled. The time frame for the conversion must also be set. "Start at six months and reluctantly move from that point up," he advised.

Who should manage the conversion? Bouloukos suggested that systems development people would be a better choice than technical services people. "Development people tend to be able to manage more people and to be able to work through a project."

Packaged Software Suggested for Switch

CAMBRIDGE, Mass. — Packaged software aids can help the DP manager convert from DOS to MVS.

"You can select more than one aid," Dean Bouloukos, a principal with Peat, Marwick, Mitchell and Co. in Detroit, said at a recent seminar here. Bouloukos listed some examples: Arkay Computer, Inc.'s Focus DOS-to-OS conversion system, University Computing Co.'s Duo package and IBM's VM.

VM does not really aid in converting DOS resources to MVS, he said, but provides the ability to operate both DOS and MVS concurrently on the same processor and to migrate to MVS slowly. It is a good tool, he said, "but I think you still should keep looking for something else to help you."

A combination of tools, such as VM and Duo, is an alternative. Duo used alone, according to Bouloukos, is a "fantastic crutch. In four months you can have native MVS source code linked to Duo with about 5% overhead. Management will put you back on development work. They will never let you finish the conversion."

Peat Marwick recently unveiled JCL and Cobol source code converters that are part of its DOS-to-MVS conversion service (story on Page 57.) Bouloukos noted that this is another alternative.

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Restructuring of Anaheim DP Department

By Robert Batt
CW West Coast Bureau

ANAHEIM, Calif. — The situation was "deplorable" when Philip Grammatica moved to the helm of the City of Anaheim's DP department two years ago. In fact, "turnover was between 60% and 70%, users looked at the DP function with frustration and the credibility gap between DP and users was so wide that I didn't know whether or not it could be overcome by improved performance."

In a report he made to city managers after he took over, Grammatica said Anaheim was poorly positioned to address the challenges ahead, noting that resources were technically uncontrollable, hardware capacity was insufficient, existing facilities were neither secure nor adequate, and the city was not in a position to develop and maintain systems properly

"Many of the current systems are old and cannot take advantage of new hardware and software facilities," Grammatica's report added. "Old systems continue to 'blow up' regularly, disrupting operations, causing reruns, consuming hardware capacity. Utilization of current equipment by old systems will remain less than efficient until the old systems can be restructured or replaced."

The management information systems (MIS) department had six programmers and a few contractors at that time. It ran a 1M-byte IBM 370/145 that was taxed to more than 92% of its capacity and ran under an unsupported version of DOS/VS. It was not until 1980 that the city began to install its first on-line development program.

Today, only two years later, things are different. Hardware facilities now include a 4M-byte IBM 4341 Group 2 processor, and software fa-

Seasoned Veteran Heads City's DP Department

By Robert Batt
CW West Coast Bureau

ANAHEIM, Calif. — To say that Philip Grammatica, director of data processing for the City of Anaheim, has been in DP for a while would be something of an understatement.

Following in the footsteps of his father, who was a DP manager at Mutual Funds Corp., Grammatica has been involved in DP since the age of eight. Educated at the University of California at Irvine, he has worked for management information systems (MIS) at a variety of companies — Honeywell, Inc., RCA Corp., Hollywood Accessories and R&G Sloan Manufacturing, Inc. (the last two as corporate DP manager) — and moved to his present job with a special vision in mind.

"Having spent 20 years in the private-sector environment, it was time to see what I could contribute to the public sector. My vision is to be the best MIS director that it is possible to be. I want to do the job in data processing as best as it can be done, and that comes from a recognition that DP is nothing more than a service environment."

Grammatica believes his role is to handle information on a timely basis and manage it effectively. Taking the City of Anaheim job in 1980 meant taking on a big challenge: "The city was on the verge of deciding whether it should have DP in-house. There were some users who were so disgruntled by the MIS function that they wanted to do away with a centralized DP department and recruit DP professionals to work directly with users."

Grammatica said the prevailing scenario had been one of lots of promises by DP and no results. Users, in turn, failed to understand the necessary commitment on their part to bring a project to its successful completion.

Grammatica had a different idea of what the DP/user relationship should be. "DP is not the authority on information requirements in user environments. We are the authority in the MIS environment," he explained. "As a user, you should be concerned with your information requirements and not have to worry about hardware and software. The user needs to specify what is required to make something happen," he said.

One of the keys to DP success, according to Grammatica, is high morale among the DP staff. "Before I came here, the DP people were working incredibly long hours, including nights and weekends, month after month. I told them I wanted a five-day week, 40 hours a week — no more unless it was a real emergency. For the first time in a long time, the DP staff was able to relax and let their breath out," he said.

Grammatica's style of management has brought plaudits from all areas of the city government. In his office hang plaques of appreciation from admiring DP staff and satisfied users, including some of those who had wanted to dismember the MIS department and confine DP personnel to specific user areas.

Narrows Gap Between Users and DP Staff

cilities include VM, DOS/VSE and CICS. Cullinane Database Systems, Inc.'s IDMS is coming on stream next month, and the installation of office automation equipment — virtually nonexistent in 1980 — is now well under way throughout city departments.

"We used to have an unsupported operating system that failed every other day. Now it is fully supported so that we are running under the latest releases that IBM puts out. It's like the difference between night and day," Grammatica said.

The number of full-time programmers has risen to 26. Turnover has been reduced to less than 4%.

To bring about such a radical change, Grammatica put into practice some basic management principles acquired with 20 years of MIS experience (see story at left). The first thing he did was put a moratorium on future development until DP had time to put its house in order. He concentrated only on major projects and current MIS commitments.

In the past, Grammatica said, Anaheim's MIS function never said "no" to users, which meant the DP staff was often overwhelmed with work. Now users are asked for a commitment to their projects before the DP staff gets involved.

In addition, DP professionals are given a minimum 40 hours of training in all areas of the city government, from management philosophy to how IDMS works.

"We needed to ask our users for patience, but there is a limit to how long they will wait. After a while we needed to produce results," Grammatica recalled.

First Victory

The first victory for Grammatica's DP department came with the successful installation of a major payroll system. A similar system had been introduced previously, but had proven to be a major headache. It was grossly overworked, leading to short tempers and frustration.

The new payroll system was budgeted at $110,000, its installation was projected for six months. The project went up on time with no failures; its final cost totaled only 65% of the budgeted amount. The users involved in the project held a party to celebrate, and the DP professionals received a certificate of appreciation.

"The payroll episode demonstrated that DP could take a major project, successfully complete it on time and within the budget set," Grammatica observed.

The payroll system set a precedent for closer DP/user interaction. Before 1980, user requests were often communicated over the telephone. Grammatica began to insist on certain agreements from users before even looking at a request for DP involvement. Before a programmer or analyst does any work requested by a user, such as maintenance or systems analysis, he fills out a work request form justifying the use of DP time on that project.

Following cost and feasibility analyses, the MIS department and the end user sign an accord that they are satisfied with the product that is about to be installed. "Our approach has been to have DP people and the user co-chair a systems development project. Without such cooperation, my experience is that it simply doesn't happen," Grammatica said.

"Hitherto, the management of DP work was a very loose affair. Now we tell people that if it isn't in black and white, it doesn't get done. In return, we have agreed with our users to respond to their request for DP assistance within five working days, indicating our estimated time frame, service costs and completion date."

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City of Anaheim Turning to OA

ANAHEIM, Calif. — The City of Anaheim's government had little to show in the way of office automation equipment two years ago. Today, it is well on its way to putting in place OA facilities that will give local government services a true networking dimension.

The city's DP department, Planning Department, city clerk's office, city attorney's office, Human Resources Department and the Parks and Recreation Department run on one Wang Laboratories, Inc. OIS 140 system connected to the city's IBM 4341 host computer. Another OIS 140 controls the handling of information for the Police Department, and Wang machines run the community development and Anaheim Convention Center programs.

The public utilities area has three Wang machines dealing with management services, field operations and the operations group. These three OIS computers talk with each other and to the IBM host.

Each user department within the city government now has the capacity to add personal computers to the OA equipment. In clerical functions alone, there has been a 30% increase in productivity since the OA equipment was installed, according to Philip Grammatica, Anaheim's director of data processing.

"We are going to tackle centralized records on the lines of a paper-

(Continued on Page 16)

Pa. to Funnel Laid-Off Steelworkers Into DP

By Paul Gillin
CW Staff

PITTSBURGH, Pa. — With 14% of its work force idle, the city of Pittsburgh has felt the bite of recession worse than most industrial towns. And prospects for quick recovery are dim in a city that has long relied upon the declining steel industry for its livelihood.

Faced with that reality, the Pennsylvania state government has recently instituted a slate of programs aimed at putting laid-off steelworkers to work in new careers. Beginning in January, one pilot program will send 120 furloughed employees back to school to learn techniques of computer installation, maintenance and repair.

The workers will be trained on Control Data Corp.'s computer-assisted instruction (CAI) system called Plato. The full-time, eight-month course at a Control Data Institute will begin in January and includes 153 hours of CAI, in addition to extensive lab work and classroom training. The cost of $564,000, or about $4,500 per student, will be picked up by the state.

Candidate Selection

Candidate selection and screening will be the state's responsibility, with applicants recommended by local unemployment offices in the Pittsburgh area. A high school diploma will be required for admission, a spokesman said.

CDC will be responsible for training the students and helping to find them jobs at the end of the program. The spokesman said a clause in the contract reduces the payment to CDC if at least 100 employees are not placed after they complete their training.

In announcing the program, Gov. Richard Thornburgh said the need for computer service technicians is expected to increase five times faster than the rate of growth for other occupations during the 1980s.

Future Evaluation

A spokesman for the state Office of Budget and Administration (OBA) said the pilot program will be evaluated at the end of the eight-month trial and may be expanded next year. The state of Pennsylvania hopes the program will serve as a model to other states facing unemployment problems, he said.

"If we can give someone a new skill, keep him working in Pennsylvania and contribute to the worker's and the family's stability, we believe it has been a good investment," Jim Wiggins of the OBA said.

A CDC spokesman said the Plato program used here will be one of the standard CAI courses used in Control Data Institutes nationwide. Plato applications span a variety of courses ranging from basic language and math skills to airline pilot training, he said.

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The Newspaper Guild
American Federation of Government Employees
Service Employees International Union
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United Auto Workers
Office and Professional Employees International Union

FACT: By 1985, CRT terminals exported to Germany and many European countries will be required to comply with stringent design criteria outlined by the German Ergonomic Standard—the same criteria used as the basis for U.S. standards and legislation.

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City Turning To Automation

(Continued from Page 15)

less office. We will need hardware and software for storing, indexing and retrieving source information — that is, information not generated by a computer," Grammatica explained.

Grammatica sees computer-aided retrieval facilities as vital to the future of OA in city government. Alongside this will go an expansion of the city's electronic mail facilities.

The city government already has a limited form of electronic calendaring by which a manager can sort through the calendars of various personnel and schedule, for example, a two-hour block of time for a meeting without picking up the telephone. A similar system is currently being installed at the city's convention center for scheduling and billing functions.

The City of Anaheim's OA program began two years ago. The OA and word processing systems are still decentralized. "We are not yet at the point of networking. This will require greater user sophistication and familiarity with existing equipment, but we see office automation expanding significantly in this direction," Grammatica noted.

Grammatica said the first thing the DP function must look for is not doing more with less, but actually doing more for less. "Getting the most out of your money doesn't mean you are going to spend less. The more opportunities we have to use this technology for productivity increases, the more we have to get on to it," he asserted.

Call for Papers

NATIONAL EDUCATIONAL COMPUTING CONFERENCE (NECC) '83, Baltimore, Md., June 6-8.

NECC is soliciting papers from all academic disciplines and research areas in educational computing. Papers on actual experiences with computer use in the classroom at all academic levels are encouraged. In addition, papers prepared by students at the secondary, undergraduate and graduate levels are also encouraged.

Authors should submit an original manuscript (double-spaced, maximum 15 pages) by Dec. 15 to A. J. Turner, Department of Computer Science, College of Nursing Building, Clemson University, Clemson, S.C. 29631.

DSS Hit as Facade to Maintain MIS Image

By Robert Batt
CW West Coast Bureau

SAN DIEGO — The current debate surrounding decision support systems (DSS) and data base technology is a facade to maintain the corporate image of management information systems (MIS), a senior educator here contends.

People do not base their decision making on quantifiable data, asserted Robert Swanson, manager of technical support at the San Diego State University computer center. Rather, they use data to protect themselves from attack by other managers.

Swanson, a former project engineer with the Saturn V rocket launch that put a man on the moon, claimed people do not handle quantifiable variables in an efficient manner. As a result, computers are not really being used to their full potential, particularly in the area of decision making.

Because managers feel a lack of competence in their ability to handle various data at any one time, decisions, he argued, are more likely to be based on a manager's past experience, on the basis of what he can control and on what he has read. In this sense, Swanson said, to claim that computers are being used as decision support systems is just not true.

"In many cases they are simply a cover-up or facade," he added.

In addition, he stated, while computer technology was made for use in high-risk decision making, because of the way the technology is currently being used so-called decision support systems tend to be confined to lower decision-making levels.

"There should be many more skills in the area of using computers and management decision making than we currently have. For example, in data base technology it is clear that instant access to obsolete data does not allow managers to do much in the way of decision making."

Such an approach, Swanson asserted, is doomed to failure. Current data base technology involves rigidity and a huge commitment to resources. The things that are really needed in data bases — up-to-date information on impending legislation, correspondence and abstracts from current journals, for example — are absent, he claimed.

Change, Swanson argued, is likely only when senior managers become much more technically oriented.

While the introduction of the personal computer and software such as Visicorp's Visicalc is causing people to look at computers from a different point of view, progress will be slow, he warned. Pointing to the field of education, he said that "quite frankly, there are some things which we are doing in education that I do not understand. For example, in the area of computer-aided instruction [CAI], we need to derive a theory of hints. Students learn by interacting with ideas and they need the hints by which they can assimilate new ideas and concepts."

Currently, he argued, CAI does not stretch a student's imagination or analytical abilities. While it may have some usefulness at lower levels of education, it seems to have little relevance for potential decision makers, he claimed.

Data Base Gives Minorities Business Data

JACKSON, Miss. — The Jackson Business Development Center here is turning to a computerized data base to provide research data to minority entrepreneurs.

Offered as part of the U.S. Commerce Department's Minority Business Development Agency, the Jackson center is one of 99 nationwide centers aimed at helping minority businessmen get started.

While the computerized data base is not yet functional, J.B. Burrell, office manager of the Jackson center, said the system will be operational in a few weeks.

Burrell explained that the system, Control Data Corp.'s Information Network, will take advantage of business research data supplied by the financial firm Dun & Bradstreet. Currently, business research information is developed by the Business Development Center's research department. Burrell said that process often takes weeks to research and prepare a report for a client. By using the information offered through the CDC Information Network, Burrell estimated it will be able to develop client reports in a few days.

Current plans for using the system at the Jackson facility call for having an office assistant trained in using the CDC data base. When a client requests information, the assistant would poll the data base and submit the raw data to a case worker who would then prepare a report for the client, Burrell said.

About 90% of money for each center comes from the federal government. The rest of funding is expected to come from other sources, such as corporate donations.

In addition, the center charges a $2.50/hour fee to firms with a sales gross less than $500,000. For firms with sales over $500,000 the fee is $5/hour, the center said.

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End User Seen 'Prime Acquirer' by End of '80s

By Bob Johnson
CW New York Bureau

NEW YORK — The end user — the user within the operational sectors of a company — will be the "prime acquirer" of DP and information processing systems by the end of this decade, and any strategic planning in this area better have the user in mind.

"DPers will still play key roles in the decision making process, of course, but users will offer continuous and increasing input."

That was the word from F.G. "Buck" Rodgers, IBM's vice-president of marketing, who spoke on the future of the strategic management of information technology at a recent seminar held here by the consulting firm of Booz, Allen & Hamilton, Inc.

The reason end users will play more important roles in planning information systems, Rodgers said, is because their traditional functions are becoming increasingly more involved with information and data. The more the value of information is realized within a company, and that value applied to the operational areas, the more end users will have a say in which information systems are appropriate.

Hardware Technology

The acceleration of hardware technology is another element driving users into system selection, according to Rodgers. He cited the implementation of Josephson junction technology for CPUs and voice recognition developments.

"We have only seen the beginning. I believe that a 5,000-word dictionary for voice recognition will be available by the end of this decade," he stated. He noted, however, that a "bridge" between old hardware technology and new advances must be built so that users do not get lost in the process.

Although Rodgers maintained that hardware will be the driving force in the future of information technology, he singled out software as offering the greatest amount of leverage. He claimed that improvements in the software area are almost nil and said he does not expect this technology's sobering effect to change much in the near future.

To illustrate his point, Rodgers referred to an "invisible backlog" of unusable information. "There are many studies which show that a good deal of data is nonaccessible because nearly 70% of software work time is spent on maintaining old files," he explained. He added that there is a sore need for sufficient software tools.

Rodgers called for greater computer literacy to meet the software challenges of the future and focused on the lack of available programmers who could develop the needed software tools. "The leverage in information technology will come from software productivity tools and packages which make people more productive," he said.

The advances in hardware will challenge people to become more productive, but unless the software is available to meet that challenge, problems could occur, Rodgers said.

Another prediction from the IBM executive centered around system ease-of-use technology, or ergonomics. Rodgers predicted that in three years, information system market decisions will be made on ergonomic considerations as much as price/performance considerations. In West Germany, he pointed out, laws prohibit the sale of terminals unless they meet certain ergonomic specifications.

"This is another situation in information technology which will be user driven and should be kept in mind during strategic planning. If the equipment does not meet certain desirable screen and keyboard requirements, users will not buy the product," Rodgers said.

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Kelly, Lohse Win Ansi '82 Award

NEW YORK — William B. Kelly Jr. and Edward Lohse will be the 1982 recipients of the American National Standards Institute, Inc.'s (Ansi) Astin-Polk International Standards Medal for outstanding achievements instrumental in advancing world trade. The medals will be presented at the Ansi awards banquet here Dec. 7.

Kelly is deputy director-general of the Geneva, Switzerland-based General Agreement on Tariffs and Trade (Gatt). His past service includes the role of chief U.S. negotiator on the multilateral trade negotiations Gatt Standards Code, said to be one of the most significant recent advances in eliminating technical trade barriers.

Lohse is director of industry relations for Burroughs Corp., where he plays a leading role in international standardization in the information systems and telecommunications fields. One of his major contributions was fostering close cooperation among the Consultative Committee on International Telephony and Telegraphy of the International Telecommunication Union and the world's two major voluntary international standards bodies — the International Organization for Standardization and the International Electrotechnical Commission.

'Embedded' Technology

Poppel: 'Fourth Wave' of Technology Imminent

By Bob Johnson
CW New York Bureau

NEW YORK — "We are on the threshold of the fourth and more revolutionary wave of technological change in information technology."

That is what Harvey L. Poppel, senior vice-president of Booz, Allen & Hamilton, Inc., told attendees at a recent seminar here on the "Strategic Management of Information Technology." Speaking about how the new technology will fit into and affect an organization's strategic planning, Poppel claimed that a "fourth wave" of technology or, as he described it, "embedded" technology will be what companies will need to know in order to integrate effective systems into their operations successfully.

Poppel described "embedded" technology as the successor to the three previous stages of information technology: isolated computer processing, consolidated data centers and, finally, distributed data processing. This embedded fourth wave will allow immediate access to information through many types of equipment, including personal computers and portable terminals.

"This is the type of technology that will drive the future," Poppel said. "Information that is embedded or immediately available to an organization is what will give it an advantage in creating a successful framework for getting information technologies into specific applications, something that has been a problem for the last 10 or 15 years."

Although information cannot yet be so readily tapped, developments in such I/O technologies as speech recognition, touch screens and high-resolution color graphics will make the embedded processing concept real to the average person and, therefore, feasible for corporate information system planning, Poppel explained.

Poppel pointed to three application areas or "arenas" that make up the "battlefield of business" and where the new information technologies will be applied and tested. Among them are mainstream business operations, the knowledge or white-collar worker and the home market.

Business operations, he said, are the key to the mainstream effect of the new technologies and are where embedded processing will increasingly add value to the stages of a business. Citing factory applications, Poppel sees "all sorts of techniques" being embedded into factory technology — intelligent robots, for example. "The question to be answered is how to migrate the existing factory so that it can exploit the technology fully," he added

Concerning the knowledge worker, Poppel said that embedded processing technologies will boost productivity while improving the quality of life. He noted that this is a very important consideration in strategic planning and that studies reveal that most money spent for information systems does not go for the knowledge worker, who can reap the most productivity, but on clerical workers.

Poppel stressed that strategic planning in information technology should reflect this worker's importance. "A study of ours has shown that knowledge workers waste time, up to 25% of the day. Office automation systems properly integrated can save time, money and frustration," he said.

Poppel offered a case study of a bank which, by installing office automation, increased its market share 50% and had a cumulative net benefit for nearly 13,000 white-collar workers of $200 million over a five-year period.

In the area of the home market, Poppel forecast that by 1990 information systems will be rooted in this market and embedded processing can allow for interrelated applications. Successful business planning should take this area into consideration, he said.

According to a study made by Booz Allen, this market will yield a $15 billion to $25 billion incremental yearly increase in the U.S., making it a market that Poppel said is hard for business to ignore.

ASM Annual Meet Set for April 24-27

CLEVELAND — The Association for Systems Management (ASM) will hold its 1983 annual conference in Boston April 24-27. The program will include two special study tracks on "Systems Tools and Techniques" and "Systems Leadership."

Seminar content will emphasize a broad range of DP topics with a special segment on office automation. Two seminars will focus on "The Information Center: One-Stop Service?" and "Preparing for the Personal Business Computer Invasion."

Registration costs $395 for ASM members and $495 for others. ASM is at 24587 Bagley Road, Cleveland, Ohio 44138.

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Managers on the Move

Charles J. Versaggi

CHARLES J. VERSAGGI has been appointed manager of management information services (MIS) for Air Products and Chemicals, Inc., an international supplier of industrial gases, chemicals, process equipment and engineering services headquartered in Allentown, Pa. Versaggi will manage Air Products' personal computing environment and provide consulting, educational and administrative services to users of MIS.

Versaggi joined Air Products in 1976 as a participant in the company's career development program and worked in systems planning for the Chemicals Group prior to his recent appointment.

He has a B.S. in business administration from Drexel University and an MBA degree from Pennsylvania State University.

•••

VINCENT VAN VLEAR has been promoted from general manager to vice-president and general manager of Equitec Financial Controls, Inc., a wholly owned subsidiary of Equitec Financial Group, which provides data processing for the parent company and its 20 subsidiaries.

Van Vlear, one of the founders of Tymshare, Inc., served 20 years in the U.S. Navy, where he was a senior chief electronic technician. While in the Navy, he was involved in the Navy's first digital equipment processing of cryptography. When he left the Navy in 1965, he joined General Electric Co. as an electrical engineer and a year later became an applications engineer.

In 1967, he co-founded Tymshare, and after 15 years with Tymshare, he joined Equitec Financial Controls.

Van Vlear studied electronic engineering for four years in the Navy and also at the College of the Pacific in Stockton, Calif.

•••

JAMES P. McILVAINE IV has joined Infotron Systems Corp. in Cherry Hill, N.J., as director of corporate management information systems.

Before joining Infotron Systems, McIlvaine was with Bridgeport Textron for the past 10 years at the controls manufacturing plant in Horsham, Pa., where he was manager of the computer facilities.

McIlvaine holds both a B.S. degree and an M.S. degree in electrical engineering from Drexel University in Philadelphia.

•••

LES OSBORNE has been promoted to vice-president of production and information processing for McDonald & Little, an Atlanta advertising agency.

Prior to joining McDonald & Little, Osborne was a financial analyst for Dun & Bradstreet Corp. Before that he was with *European Stars & Stripes*, a daily newspaper for military personnel in Western Europe, located in Darmstadt, West Germany, where he designed an automated general ledger and reporting system.

Osborne earned a B.S. in business administration from Ohio State University and later earned an associate's degree in programming and systems design from the University of Maryland.

•••

ERIK FERGUSON has joined Nationwide Insurance in Columbus, Ohio, as director of systems development. He is responsible for developing Nationwide's auto processing system and underwriting systems for its Western personal lines operation in Portland, Ore.

Ferguson spent eight years with Allstate Insurance Co. and five years with Equitable General Insurance in the development of claims and auto systems. For the last two years he was manager of applications programming for the Western Co. of North

Managers on the Move

America at Fort Worth, Texas.

•••

LARRY SCHEPERS has been named director of corporate computer facilities and VINCENT J. KAIMAN has been appointed corporate manager of systems development at Mallinckrodt, Inc.'s headquarters in St. Louis.

In his new position, Schepers will direct the staff responsible for planning and scheduling data center activities, computer operations, data control and report distribution and technical software support. An employee of Mallinckrodt since 1975, he has held a number of positions in systems development. His most recent position was manager of systems and programming for the Food, Flavor and Fragrance Group and the International Group.

Kaiman's new responsibilities include direction of systems development and programming for all centralized corporate functions and for the Food, Flavor and Fragrance and International Groups. He joined Mallinckrodt in 1981 as divisional controller for the administrative services functions and held that position until his recent promotion.

Kaiman holds a B.S. degree in business administration from the University of Missouri.

•••

LEE W. SPITLER has been elected a senior executive vice-president of Irving Trust Co. in New York. He will continue to be responsible for all operations activities.

Spitler joined Irving Trust in 1969 as a vice-president and manager of computer operations. He was elected a senior vice-president in 1972 and an executive vice-president in 1976. Prior to joining Irving Trust, Spitler was vice-president of operations for Computax Corp. and was a career officer with the U.S. Air Force from 1939 to 1964. He specialized in data automation and was discharged with the rank of colonel.

Spitler is a graduate of the University of Maryland, holds an MBA degree from George Washington University and attended the Advanced Management Program of Harvard University's Graduate School of Business Administration.

•••

THOMAS J. LAWLOR has been appointed data processing manager for Heyco Metals, Inc. in Reading, Pa., a distributor and fabricator of cold rolled copper-base alloy strip. He will be responsible for development of manufacturing and marketing systems to initiate and support marketing efforts to the automotive, appliance computer, business equipment, electrical and electronic industries.

Prior to joining Heyco Metals, Lawlor was a field engineer with IBM, a marketing representative with Mohawk Data Sciences Corp. and a consultant in business system development and service.

Lawlor is a graduate of Muhlenberg College where he earned a B.S. in business administration.

•••

DENNIS E. CARLSON has been promoted to assistant vice-president of Safeco Insurance Co. of America in Seattle.

Carlson joined Safeco as a systems analyst. He was named manager of corporate systems and programming in 1977 and director of data processing in 1980.

He graduated Washington State University with a B.A. degree in mathematics.

•••

DAVID L. DAWSON, director of information services for Matson Navigation Co. in San Francisco, has been appointed a vice-president.

Dawson joined Matson in 1979 after serving as director of corporate management with United States Lines and before that as director of systems development with Sea-Land Service, Inc.

He received a B.S. degree in accounting from Seattle University and a master's degree in management sciences from the Stevens Institute of Technology in Hoboken, N.J. Dawson is a member of the American Management Association.

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Network Keeps Tabs on Vacation Time-Sharing

INDIANAPOLIS — Every year, hundreds of thousands of people around the world spend their vacations in houses, hotel rooms and condominiums owned by complete strangers.

These people are not squatters but devotees of a relatively new concept in vacationing called time-sharing, which allows them to own a portion of a vacation resort hideaway and each year swap places and residences with similar owners throughout the world. Fortunately, there are computers and computer-based services that keep tabs on this widespread swapping and globe-hopping.

Resort Condominiums International, Inc. (RCI) and Vacation Horizons International, Inc. (VHI) are separate vacation exchange businesses that share common computer resources. RCI calls itself the oldest and largest exchange network in the world, with more than 250,000 members from 700 participating resorts in 32 countries, according to spokeswoman Renee Spencer. VHI, formed in 1981, offers the same services for 100 resort locations worldwide as well as marketing, sales and other training for resort owners.

Founded in 1974 as a two-person operation, RCI has grown to include a staff of 250 in five offices and two satellite locations worldwide, Spencer said. RCI automated with a Wang Laboratories, Inc. VS 80 computer in 1977, but business has grown so quickly that the company recently joined with VHI to add IBM 4331 and 4341 computers to the network and to increase its storage capacity to 4G bytes.

RCI/VHI use the three systems to process all vacation exchange requests as well as for word processing and financial and market analysis. The vacation exchange system works like a checking account, Spencer said. Members submit a week of time when their condominiums or homes will be available for occupancy. In exchange, they can request a week in another location that is on their service's network. The requests are processed continually in batch until a match is found.

On-Line Service

An on-line service is also employed which members can call to get up-to-date information on their accounts and requests. RCI members pay an annual fee of $42 and a service fee of $38 for each week of vacation exchange requested, Spencer said. Charges for VHI are slightly less.

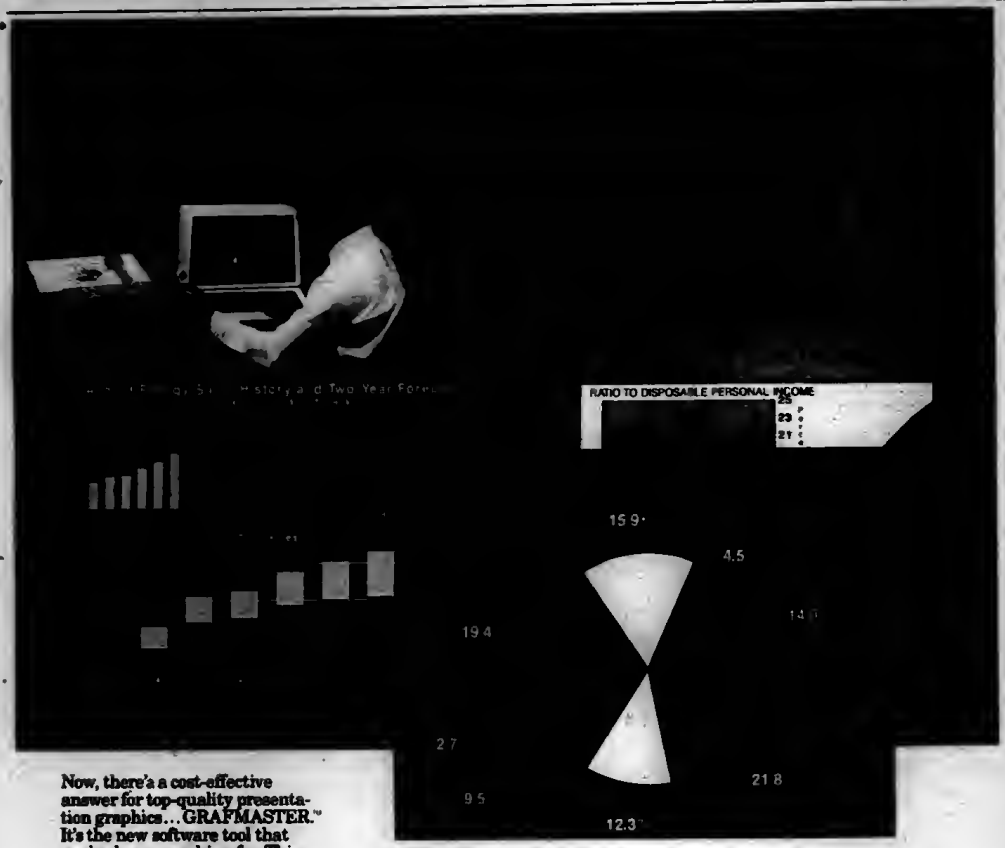
"This company is in the information exchange business, and we expect to continue our 50% growth for some time to come," said Pete Travis, executive director of management information systems (MIS). "To do this job manually would either be impossible or we would have to add many more people to the staff. But even with added employees we couldn't be as precise in confirming exchanges or as efficient. It simply couldn't be done," he said.

Travis said one of the prime factors in the company's decision to select the IBM 4300 series was the product's potential for expansion, he said. "We have laid out an MIS plan over the next five years that lands us on a 4341 Model 2 next year and a 3083 by sometime in 1984," he said.

RCI/VHI now employs a staff of 25 in the MIS department. Travis said the 4331 is used primarily for development and some applications while most major applications are run on the 4341.

The computer is capable of making 460 searches in 30 days for a subscriber who submits a request for four locations, Spencer said. If no match is available at the resort requested, the computer can search nearby locations for vacancies.

The systems used by RCI/VHI run on IBM's DOS/VSE operating system with CICS/VS communications software, DL/1 data base management facility and DMS in Cobol for applications development. DP printing is handled on an IBM 3202 Model 5 printer at 1,200 line/min.



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DPers Advised to Take Active Business Interest

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — Self-confidence, assertiveness, good interpersonal skills and an ability to balance short- and long-term strategies are some of the key qualities necessary for a successful computer industry career, attendees at a recent conference here heard.

The conference attendees, who included many programmers, were also told to take a greater interest in the business activities of their companies and develop a broader perspective in order to understand senior management viewpoints. The conference, entitled "How to Make Money in Technology," was sponsored by the Bay Area chapter of the Association for Women in Computing.

"Data processing people do not learn the business the way they should," said Elizabeth Strohl, senior vice-president for Bank of America Corp. "It's really important that they do this. If they don't, they will not be able to deliver the kinds of products that users need."

Strohl argued that it is important for DPers to recognize the corporate culture in which they operate. They should build solid relationships with users and other systems people. "Since you do not know what you are going to be doing in 10 years' time, these contacts can be quite useful," she remarked.

Know Strengths

Also speaking at the conference was Sandra Kurtzig, president and founder of ASK Computer Systems, Inc., who asserted that the key in starting a business is to recognize your own strengths and weaknesses. One should never be afraid to hire people who are better at certain jobs than you are, Kurtzig said.

"You need to create a team spirit and atmosphere in which people feel what they are doing is important for their own future and the future of the company," she added.

It is vital to concentrate on a product and not be sidetracked by the lure of short-term cash, Kurtzig stressed. "There needs to be a balance between long-term and short-term strategy in terms of financing your company. Bring in good outside advisers with expertise in different areas such as marketing, finance, administration and law."

Second Product

According to Gordon Eubanks, vice-president of languages at Digital Research Corp., the biggest problem faced by would-be computer industry entrepreneurs is the introduction of a second product.

"It seems impossible for many to get beyond their first product. The demand for and the support required of the first product often brings people to their knees. You need to look at the whole picture, determine how you will follow on from your first product and take this into account in your long-range planning," he told his audience.

Eubanks claimed there are incredible opportunities for programmers who want to start their own software businesses in the microcomputer sector. However, he warned of pitfalls: "Don't put your product out before it is ready. If you have done your homework in finding a niche in the marketplace, there is always time to do it right."

He also advised DPers not to quit their jobs when they are in the early stages of starting a new company. They should not become dependent on the success of their new ventures and lose all perspective, he said.

Eubanks also advised against hiring lawyers. "Small companies do not need the same protection as IBM. Use your common sense and you will do fine," he said.

DPers, he added, need to be aggressive. They should look forward rather than over their shoulders at their competitors.

And "it is vital to get good people around you," Eubanks said. "While it sounds obvious, it is one of the biggest mistakes small companies make. The people you bring in need to have the capability to grow with the organization, otherwise you are going to have problems in the long run."

Data Base Meet To Be Offered On Three Dates

LYNNFIELD, Mass. — Digital Consulting Associates, Inc. (DCA) has announced that its National Data Base Management Symposium will be offered three times in 1983: March 1-4 in Los Angeles, April 18-21 in Washington, D.C. and May 16-19 in Chicago.

The symposia will focus on new and enhanced data base and data management products for all types of computers, a spokesman said. Topics to be stressed include high-level applications generator languages, data base design-aid products and new user-oriented, easy-to-implement data base management system capabilities.

Speakers will include Dr. Edgar Codd, IBM fellow; Charles Bachman, vice-president, Cullinane Database Systems, Inc.; Thomas Nies, president, Cincom Systems, Inc.; and Dr. George Schussel, DCA president.

Conference registration costs $650 for four days or $350 for the seminar day only. DCA is located at 5 Kimberly Terrace, Lynnfield, Mass. 01940.

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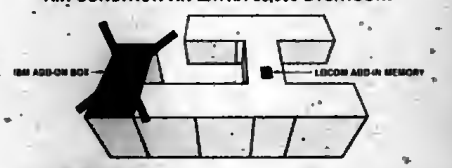

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Sheriff Getting Dispatch Displays in Color

ROSENBURG, Ore. — Whether tracking a thief or dispatching a fire truck, Douglas County relies on a computer that provides information in a four-color display to handle emergencies around-the-clock.

The system is one of the few to utilize computer color displays for dispatching for a county about the size of Rhode Island. "Computer dispatching gives us two advantages over the prior system," according to Jim Main, sheriff's office spokesman. "One is eye ease. Our previous system used a microcomputer and two terminals with small black-and-white screens. Color stands out better. It lets the dispatcher get his or her job done faster and more accurately."

The Douglas County Sheriff's Department has installed four IBM 3279 color display terminals, which are linked to an IBM 4341 computer for instant retrieval of vital information. Operated by keyboard, the terminals can present information on TV-like screens in easily readable text with key items highlighted in as many as four colors, a spokesman said.

Crime Reported

Upon receiving a report of an accident or crime and its location, a dispatcher queries the computer to identify the patrol cars assigned to that vicinity. If this car is busy, the screen indicates available units to cover the call and back up the responding unit if necessary.

The car is contacted and assigned. If the accident involves injuries, an ambulance serving the area is identified and dispatched. The IBM system can provide the nearest cross-street from its street location file. As the police investigate, they may require additional information such as a residence address or vehicle description, which is also immediately available via the central dispatching operation, a spokesman said.

With some additional programming, the terminals can display color graphics such as charts and diagrams. This application is useful in quickly depicting crime trends so that police officials can take action.

"Another advantage," Main noted, "is that the computer terminals allow us to get at a lot of information quickly at the critical time it's needed. For example, vital information is kept on over 300 full- and part-time officers, search and rescue volunteers and firemen. In case any of them are injured, we can quickly determine that person's blood-type, allergies, physician's name and next of kin.

"If we need additional manpower," Main said, "we know who's available during certain hours and how to reach them."

During shooting investigations, the color terminal can assist investigators in identifying stolen weapons recorded in local, state and federal files. Also on record are gun permit files of local law enforcement agencies that show owners' names and addresses and the serial numbers of their weapons.

Investigators also can tap nationwide criminal information stored in computer files. This information is provided by other law enforcement agencies as part of an information exchange. Another file contains essential information on businesses in the county and who to contact if a store or company is robbed or damaged or if a door is left unlocked.

"With a few modifications, the system was installed and operational in two weeks," according to Elton Szpaller, county DP director. "As needs arise, other applications will be added. If we had to develop programming ourselves, it would have taken several years and cost the taxpayers a lot of money."

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Proceedings Out For Syntopican

WILLOW GROVE, Pa. — The 1982 edition of *Papers and Proceedings*, a compilation of presentations made at Syntopican X last June, is available from the International Information/Word Processing Association (IWP).

The conference's theme was "The Information Manager in Focus: A Key Role Takes Shape." Included in the book are "Professional Workstations: Increasing Executive Receptivity" by Brian R. Blackmarr and "Working Together — Improving Communication on the Job: A Workshop" by Sherod Miller.

The book costs $40 (plus $4 postage and handling in the U.S. and Canada or $8 foreign) from Dorothy Logan at IWP, 1015 N. York Road, Willow Grove, Pa. 19090.

Directory Lists New England DPers

SCITUATE, Mass. — Bradford Co. has announced the publication of its *1983 New England Directory for Computer Professionals*.

The directory reportedly lists some 500 New England companies and their computer installations. Information about individual DP departments includes hardware, software, languages used, data base employed, major applications and DP staff size and hiring plans.

The directory costs $28.50 and can be ordered from Bradford Co., P.O. Box 256, Scituate, Mass. 02066.

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And Manufacturing Software

Boatmaker Crafts Success With Consultant's Aid

ORLANDO, Fla. — A boatmaker here assembled a smooth-sailing manufacturing system by selecting packaged software and enlisting the aid of a consulting firm to help put the pieces together.

When Correct Craft, Inc., a manufacturer of tournament ski boats for water-skiers and other high-performance craft, determined a need to upgrade its manufacturing control system, its controller, Denny Gillard, began an exhaustive search for the right packaged software. The firm was running a Digital Equipment Corp. PDP-11.

After consulting with Joe Conley, Correct Craft's data processing manager, Gillard selected the manufacturing system offered by Mini-Computer Business Applications, Inc. (MCBA) of Montrose, Calif.

Conley later read in an MCBA newsletter about the consulting work being done by the Naperville, Ill.-based Business Technology Group (BTG) for other MCBA manufacturing end users. He invited the firm to visit Correct Craft for a three-day consultation. "It's very costly to learn which packages to install, and how to install them the hard way. If you can get the knowledge from someone who has already been down the track, it makes things much easier," he said.

During the three-day period, the BTG consultant, Steve Balta, evidenced a familiarity with the MCBA packages and began to analyze Correct Craft's manufacturing system requirements.

Production Interruptions

Production at Correct Craft had been interrupted often by shortages of certain inexpensive but vital components. As Conley explained, "In our operation it is possible for lack of a 15-cent item to completely halt production." This pointed to the need for inventory control and material order forecasting.

"We are something like an auto manufacturer," Conley said, "where a boat under construction goes through a series of departments. We have to keep track of thousands of parts and lots of materials, such as liquid resin, to ensure that we have adequate supplies on hand for each department in the system."

Prior to the BTG consultation, Correct Craft had planned to install an automatic reorder point system, part of MCBA's Inventory Management (I/M) package, to keep ahead of materials supply problems. However, the BTG consultant recommended that the firm use ABC Analysis, another part of the MCBA I/M package. The ABC analysis is intended to allow a manufacturer to put his efforts into closely controlling the more costly "A" items to achieve a minimum inventory level without shortages, Conley explained. The "C" items, because of their low value, can be ordered in large quantities with little effect on inventory value, but drastically decreasing shortages.

Maintenance of accurate inventory records was another problem at Correct Craft, and the BTG consultants suggested the use of the cycle-counting feature of the MCBA I/M package. Following this advice, Gillard and Conley began a new cycle-counting procedure, beginning with physical counts that were made daily in some cases.

"We're aiming for 95% accuracy," Conley said. "We've begun training our foremen in the new system to ensure that all inventory transactions will be handled efficiently and accurately. The program has helped us locate many problem areas we would never have identified otherwise."

The second major step for Correct Craft was to install MCBA's multilevel Bill of Material Processor. This was intended to assist the firm with materials requirement planning, as well as to allow Correct Craft to generate "pick lists" for the materials needed to be delivered to the various manufacturing operations. It also enables the firm to generate its gross material requirements on the basis of the actual boats being scheduled.

Both Gillard and Conley agreed that BTG's assistance helped them organize their DP system for future expansion. "As we grow, we'll be able to integrate the other MCBA manufacturing system packages smoothly," Conley said.

Training Series Out On Quality Circles

WAUREGAN, Conn. — The Quality Circles Video Training Series has been released by Industrial Video Source Co.

The 15-program series was designed not only to teach participants basic problem-solving techniques, but to provide company executives and managers with the information necessary to implement the program.

Totaling nearly three hours and available in most video formats, the series of cassette tapes costs $2,000 from Industrial Video Source through P.O. Box 226, S. Walnut St., Wauregan, Conn. 06387.

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Ariz. Computer Law Conference Scheduled for Jan. 24-26

PHOENIX — The Arizona Law and Technology Institute and the College of Law of Arizona State University will host an Advanced Computer Law Invitational Conference Jan. 24-26 at the Alamos Resort in Scottsdale, Ariz.

The conference and workshops will focus on legal issues of emerging technology, a spokesman said. Participants will include general counsel from Apple Computer, Inc., Commodore, Inc., Honeywell, Inc., Intel Corp., IBM, ITT and Sperry Univac. Many private practitioners and computer law specialists will be featured, including Robert Evans of IBM and Daniel McCracken.

Topics to be discussed include antitrust regulation of the computer industry, formation of start-up ventures, sale of personal computers, software protection, government regulation and standardization, trade-secret protection and computer industry litigation and alternatives, according to a conference spokesman.

Registration costs $525 before Dec. 15 and is limited to 200 people. Information is available from Ed Johnson, Community Relations Coordinator, Room 105, Arizona State University College of Law, Tempe, Ariz. 85287.

Legislative Info System Launched by State of Oregon

SALEM, Ore. — The state of Oregon has launched a dial-up Legislative Information System that allows voters to obtain the latest information on any bill being considered during the state legislative session. The system is accessible by anyone with a terminal and a telephone line, from any point in the U.S.

On-line since July, the system allows users to tap into the legislative process via the state data center's IBM 3033 host computer. The link making the system possible is a Protocol Computers, Inc. PCI 1076 Ascii-to-Systems Network Architecture/Synchronous Data Link Control protocol converter, explained Dale Claudel, director of the Oregon Legislative Information System.

The protocol converter is connected between the 3033 and a modem on a leased line to allow dial-in to the legislative data base. The computer will serve year-round as an information retrieval center allowing legislators and the public alike to look up any state law, administrative rule, attorney general's opinion or appellate court decision.

Currently used mostly by lobbyists to track legislation and committee hearing schedules and to do searches on various subjects, the system to date has no individual users, although there "eventually will be, especially as cable television networks are made available to homes," Claudel predicted.

With a total of "27 or 28 users," several are law firms that use the service as a legal research tool, Claudel added. "As more and more law firms realize they can afford it, we expect them to become the largest year-round type of user," Claudel said.

Users pay an initial connect fee of $55, with a flat monthly charge of $20 to cover billing, training and service usage. Since the entire range of Ascii devices can be linked to the line using the PCI 1076 interface, the initial cost to users for a terminal and modem reportedly can be as low as several hundred dollars.

That is in contrast to Oregon's previous dedicated-line legislative information system — begun in 1978 — that cost users at least $5,000 for an IBM-compatible terminal as well as the cost of a telephone link.

Today's system has cost the state the $4,500 price tag of the protocol converter and works on a regular telephone line, eliminating the need for a permanent two-way link.

The service originally began as a way to save on printing costs, Claudel explained. "We supply as public record the service of the legislature in printed form," he said.

"By making the information available through terminals, we saved on printing costs, but originally only large firms with the expensive equipment could afford the service," he added. "Now with more and more terminal hardware available, it is more cost-feasible to more people."

The system has run "very smoothly," Claudel said, with "no problems whatsoever."

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Feb. 8-10 NIMR Meet To Examine Micros

SANTA MONICA, Calif. — "Personal Computers in Business" is the title of a conference that will be held by the National Institute for Management Research (NIMR) on Feb. 8-10 in Los Angeles.

The conference will provide an update of technology and concerns and will feature representatives from 17 vendors and consulting firms. Sessions will cover planning and acquisition strategies, technology surveys and applications of personal computing.

Registration costs $595. NIMR can be reached through P.O. Box 3727, Santa Monica, Calif. 90403.

Cataloging Over 35 Million Artifacts

Canadian Museums to Go On-Line for Posterity

By Paul Gillin
CW Staff

OTTAWA — The National Museums of Canada (NMC) are now building what is reportedly the world's most expansive on-line catalog of that nation's museum holdings. More than 35 million artifacts from 152 member museums are included, with nearly all of the country's 250 major museums expected to be on-line eventually.

By their very nature, museums are institutional pack rats, according to Peter Homulos of NMC. "Museums have literally tens of thousands of objects in their collections spanning nearly everything made by man and God," he said.

And unlike libraries, their collections do not speak for themselves. Each museum piece has a unique history that may merit pages of explanation, a fact that makes compiling a museum catalog especially difficult.

The system will open a new spectrum of research to historians and will speed information management procedures at participating institutions, said Homulos, who is the director of the Canadian Heritage Information Network, the branch of the NMC that administers and supports the computer network.

Access to List

Each member institution will have access to a list of holdings in other member museums and can maintain an inventory of its own collection cross-indexed by nearly 3,000 available categories, Homulos said. The system is based on a Control Data Corp. Cyber 170/720 computer with Pictorial and Artifact Retrieval Information System (Paris) software developed by CDC.

The system includes 1.5M bytes of main memory and 3G bytes of storage. When installed, the data will be available on a nationwide network of 110 terminals.

Paris replaces an existing inventory program called Isis, which NMC member institutions have used since 1972. In the first six years that Isis was on-line, Homulos said, "The number of participating museums mushroomed from 35 to 152. We had to declare a moratorium on new members," he said.

The NMC discovered that even more than a master data base, member museums required a sophisticated system for data manipulation. Records must be changed, for example, whenever an artifact is removed for restoration or lending or if new information about it turns up.

With 360,000 artifacts cataloged from its collection, Homulos said, "The Royal Ontario Museum runs about 5,000 transactions a week. With a volume like that, they would need seven operators just handling routine slips under a manual system. With this they need just one data entry operator."

With Paris, each member can maintain and manipulate its private data base while offering a general list of items to all system users. According to Homulos, each member institution will be able to catalog artifacts in an almost unlimited range of categories. So a museum administrator can access the data base by identification numbers, names of catalogers, location or date of cataloging, while a historian can list artifacts by name, description, manufacturer, color or size.

Thus, Homulos said, the system will be a particular boon to museum researchers. "Research is recorded in a continuum, reducing the large amount of time a researcher has to spend just finding out what research has already been done," he said.

In a field in which storage space and clutter is a constant problem, computer cataloging has helped one user, the British Columbia Provincial Museum, delay expansion plans by 10 years, according to Tom Loy, the museum's assistant curator for collection management.

"The main part of our collection is stored according to the excavation," meaning that artifacts of very different sizes may have to occupy the same storage area, Loy said. "We've now mounted our collection in modular drawers with an address in the system for each drawer." Despite the fact that different artifacts from an excavation are stored in different drawers, "we can draw out a list of a whole excavation if we want."

Loy said museum management has seen dramatic time-savings from the computer search capability. A request, for example, for a list of bone hair implements takes 30 seconds by computer, he said, or six days by hand.

"Also, a lot of items tend to get lost over time," Loy said. "With the computer we can draw up a complete physical inventory of our collection every two or three years."

Security is provided by a 12-level system of account numbers and passwords. Any user who incorrectly enters a password twice is automatically logged off and must wait for NMC personnel to reestablish the communications, Homulos said.

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ECS 4500 Network Terminal

Bank Brings its COM Production Home, Eases Processing Logjams, Adds Services

BRANDENTON, Fla. — Before First City Federal Savings & Loan Association brought its computing in-house, it had been sending its computer tapes to a computer output microfilm (COM) service bureau 50 miles away. The service bureau would use the tapes in its COM system to produce microfilm.

Now that its COM production has been brought in-house, however, the bank has slashed processing slowdowns and used excess system time to serve a variety of other users and generate added income.

"When you're as far away from your service bureau as we are, you can have problems," O. L. Orlando, assistant vice-president and manager of micrographics and record management for First Environmental Services, Inc., a subsidiary of the Savings & Loan Association, said. "If anything at all goes wrong, you risk meeting your courier deadline. If that happens, then it's unlikely your fiche comes back in time for the start of business the next day.

"With an in-house system, you can make adjustments for most computer problems that develop," he said.

Cost-Justified Move

The in-house COM system became operational during the first week of November 1981.

Basically, the bank cost-justified its move in-house on the basis of using the system's excess production capacity to serve other local COM users. The system is based on an NCR Corp. Model 5533 minicomputer. The 128K-byte minicomputer, which has built-in provisions for expansion up to 512K bytes, controls the tape drive and the fiche processor.

"We can use the mini to handle more than one tape drive and processor, and the system has the capacity for adding telecommunications modems," Orlando said.

The microprocessor-driven camera of the NCR unit is said to be the fastest in the industry and also has the least moving parts. The fiche processor does everything automatically, Orlando claimed. This starts with patented alignment of forms overlays, eliminating the need for manual sighting, and proceeds through recording, cutting and developing, he said.

"The end product is a finished cut fiche, which can be inspected and duplicated," Orlando said. "There is no need for a separate darkroom, and you eliminate the waste which is inevitable with roll film."

Consolidating everything into a single, continuous procedure also speeds up production, he noted. The first fiche is produced in about four minutes and additional masters can be produced in about 75 seconds.

The COM unit can produce either 42X or 48X reductions. The former puts 224 frames on the 4-in. by 6-in. film, with 16 frames reserved for eye-readable characters and one frame for an index. The latter puts 288 frames on the film with 18 for eye-readable characters and one for an index.

The operating software for the system is interactive. This produces prompts on the CRT screen of the console when job parameters, type of input, formatting, indexing and titling are to be keyboarded. For more experienced operators, there is a direct-entry mode for storing instructions on the 10.2M-byte hard disk drive.

Self-diagnostic features also warn if a circuit board is going bad. That helps the service people pinpoint potential problems and increases the uptime.

For fiche duplication, First Environmental Services installed a medium-speed, vesicular model, the NCR 4203V. Using heat as the developer, this can produce up to 600 copies an hour, Orlando said.

'Syntax Error, Do Not Pass Go, Do Not Collect $200.'

ABA Planning Net Workshop

WASHINGTON, D.C. — The American Bankers Association (ABA) is sponsoring a "Telecommunications and Financial Networks Workshop" Feb. 6-9 at the Hyatt Orlando in Kissimmee, Fla.

Topics to be addressed include the changing role of telecommunications management, network control and voice and data integration. Sessions will be organized into five tracks: applications, voice and data, tutorial, corporate electronic funds transfer (EFT) and retail EFT.

Registration fees are $430 for ABA banks and $540 for others to the Banker Education Network, ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

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System Allows Firm to Shoot Through Roof

ORLANDO, Fla. — Business was literally, as well as figuratively, going through the roof here at Kennedy Sky-Lites.

The third largest manufacturer of residential and commercial skylights had been growing at an "exponential rate," Kent Weisner, president of Kenergy Corp., Kennedy's holding company, said. "I became concerned about how we were going to handle the business in a year or two and decided it would be wise to computerize now."

Kenergy helped outline Kennedy Sky-Lites' needs — the company required a small computer system to handle accounting applications. Because it needed an automated research and development (R&D) department to test and plan products more efficiently, the company required a computer that could perform scientific applications and simulation techniques.

"We had a small IBM System/32 that was unable to meet our needs," Connie Walburger, vice-president of administration, said. "Even the System/34 did not have the software capability necessary for our research and development staff. A large IBM or [Sperry] Univac mainframe was economically out of the question."

The company evaluated the offerings of both large and small vendors, as well as service bureaus. Kenergy finally selected the Wang VS system from Wang Laboratories, Inc. To defray some of the costs, it decided to provide computing services to the general market with a separate subsidiary called Kencor Corp.

System Installation

In May 1980, the Kenergy Corp. installed its Wang VS with 512K bytes of memory and 1M byte of disk storage. Presently, six local terminals and two remote terminals work in conjunction with three printers. The system has full telecommunications capability.

Because the equipment is so easy to use, Walburger claimed, the company hired just one programmer and trained one in-house person to run the equipment.

The benefits of the new system have been heralded in several departments. "We now have a totally integrated accounting system," said Harold Johnson, controller for Kenergy. "Each separate module is interfaced with the general ledger. This allows us access to output updated fiscal status at any time."

The Wang system also reportedly provides information at the manufacturing plant level. Lee Wall, plant manager at Kenergy, explained: "With workstations and a printer in the plant, we can monitor many important variables. Inventory is immediately available to us — as are raw materials, work-in-process and finished goods. Reorder forms can be generated on the VS for both maximum and minimum quantities.

"It is also possible to determine the amount of scrap appropriate for recycling as well as the waste that we must discard. This is necessary for us to do the costing that is calculated by the Wang system," Johnson claimed.

Johnson said the system calculates sales distribution by models, in descending order of sales and geographic areas. It also produces management reports for forecasting and decision making. "We have extreme flexibility in data retrieval," Johnson noted.

The R&D group uses the system to design energy-efficient products and to determine the optimal number of skylights warranted within certain design criteria. The staff can also tell a customer the pay-back period he can expect, his return on investment and energy savings relative to an alternative source of light and heat.

"With the aid of our VS," Weisner said, "we can not only remain in the vanguard of the industry, but also expand into the computer industry with a variety of products, including on-line computing, time-sharing and software applications."

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NTP Accepting Bids For Fose Awards

WASHINGTON, D.C. — National Trade Productions (NTP) is accepting nominations for its annual Fose Professional of the Year Award to be presented at the Federal Office Systems Expo (Fose) here in March.

Two people, one from government and one from private industry, will be recognized for outstanding achievement in the field of office systems integration. The theme of the 1983 Fose is "Office Systems Integration: Myth or Reality." Recipients will be chosen based on their creativity and innovation in planning, implementing and analyzing a successful office systems project in information management, integrating two or more technologies.

Nomination forms are available from NTP at 9418 Annapolis Road, Lanham, Md. 20706.

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DP Division Adds 25 TSO Users With Installation of Disk Drive

ATLANTA — When the DP division of a bank holding company here planned on adding 25 users of IBM's TSO, management knew disk limitations would result in increased queue time and provoke a programmer productivity glitch.

The TSO additions at Trusco Data Systems nearly doubled the number of terminals running on the company's IBM 370/168 Model 3. According to Robert M. Horton, Trusco vice-president, DP personnel believed the 370 would not be able to handle the added TSO users, plus an extra requirement for batch processing in the same machine, without significant additions of memory and disks to the mainframe's Model 3's 6M bytes.

"We knew that in adding that many TSO users, we might have CPU cycles in the 370 to handle the job if we had enough memory to do the work," said Leonard Sutton, Trusco's manager of technical services. "But at the same time, it is extremely difficult to judge how much memory is needed.

"Tuning and monitoring TSO is an ongoing task," he added. "In our experience with TSO, you have a memory-constrained environment because of the size of the swap sets and the amount of activity going on."

System Choice

After scanning the market of IBM-compatible memory equipment, Trusco ordered the Storage Technology Corp. 4305 solid-state disk drive with 22.5M bytes of semiconductor storage and two dual-ported control units.

Trusco timed the arrival of the disk drive to coincide with the increased TSO activity and redefined its I/O configuration for MVS to accommodate the 430S, coordinating the new software with the release of the operating systems Trusco was planning to install.

Trusco also purchased an IBM 2880 Model 2, a two-block multiplex channel for the 370, prior to installing the disk. With dedicated channel paths to the CPU, Trusco thought it could be guaranteed high transfer rates and avoid the unproductive device contention that would result as processing activity degraded the capacity of one channel.

"We bought it [the 4305] initially planning to use it for swapping activity," Sutton said. "We felt that under peak loads we needed about 16M bytes to support all the swap sets for the number of TSO users we'd have."

Trusco is now using the 4305 for paging and swapping, having found the throughput even more attractive in that environment. Sutton said, "We've gone from an average of 27 TSO users to 40, with peaks of 48. We have a first-shift TSO response time of less than one second, which we consider adequate.

"We ran at peak five TSO transactions per second on the 370, which is 10 swaps per second of 160K-byte working sets," Sutton continued. "That's more than we could reasonably expect to accomplish without adding significant channels of [IBM] 3350 devices and lots of fixed heads."

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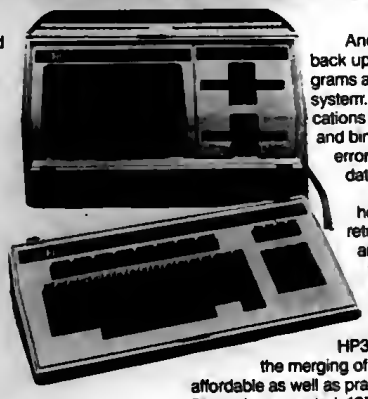

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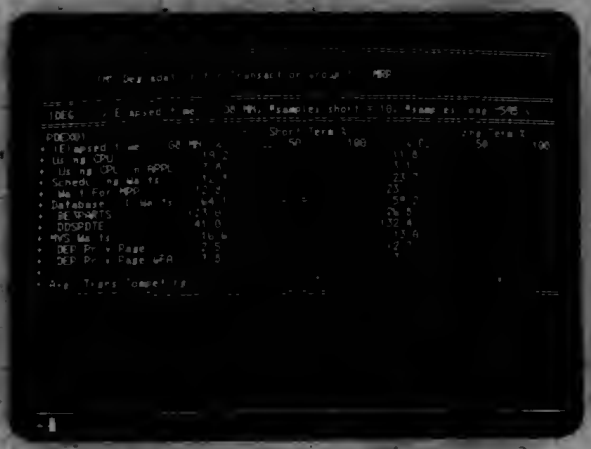

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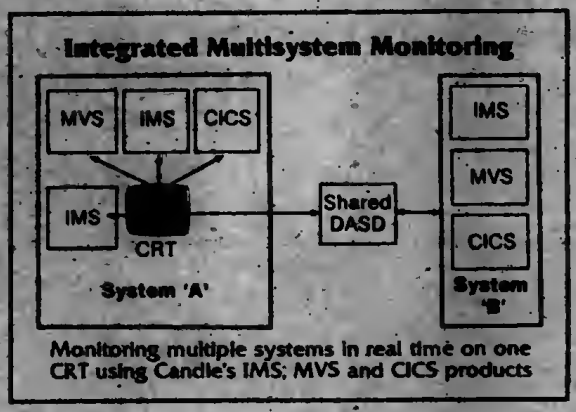

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NMA Updates Report, Offers Special-Interest Packages

SILVER SPRING, Md. — The National Micrographics Association (NMA) has released an updated version of its "Resource Report No. 11" and announced two special-interest packages.

The updated research report, titled "Job Descriptions: Micrographics Production Operations," includes 15 job descriptions based on composites from various companies and facilities in the micrographics industry, a spokesman said. The report costs $4.

"Office Automation: Current Perspectives" is a special-interest package consisting of overview and state-of-the-art articles that include an introduction to office automation, descriptions of technologies involved and human factors, the spokesman said.

"Word Processing Today: An Overview for the Generalist" is a special-interest package presenting overviews, reports, case histories and surveys. Topics include cost justification of word processing, salary information and word processing in the automated office.

Both special-interest packages cost $20 from NMA at 8719 Colesville Road, Silver Spring, Md. 20910.

Book to Detail 400 Data Bases For Business

RADNOR, Pa. — "Data Bases for Business," a directory of 400 computerized data bases devoted exclusively to the needs of business, will be published by Chilton Book Co. next month.

Written by consultants Van Mayros and D. Michael Werner of Infomark Systems Associates in Gainesville, Fla., the book focused on applications. Its first section will explain how to use a data base and how to locate the one most appropriate for the user's needs.

The second section will include profiles for each data base, supplying information such as name, producer, class, data source, size, maintenance, subject, profile, application and subject cross-reference.

The guidebook is intended for administrators, managers, analysts, students and librarians, according to Chilton, and includes subject, producer and vendor indexes.

"Data Bases for Business" contains 178 pages and will be published in hardcover ($27.50) and paperback ($19.95). Chilton Book Co. is located in Radnor, Pa. 19089.

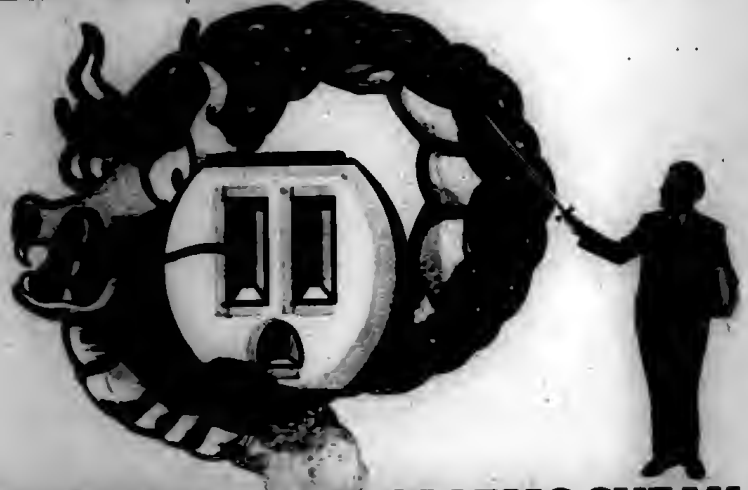
Training Courses Focus on Focus

ARLINGTON HEIGHTS, Ill. — Advanced Systems, Inc. has added seven computer-based training courses on the Focus language to its library of computer-aided instruction.

The nonprocedural report generator language is taught via a series of interactive exercises, a sample data base, student guides and a coordinator guide. Topics covered include basic report preparation, field manipulation and record selection, advanced reporting techniques, file design and maintenance, file definition, file access, interactive data entry language and graphics.

The course runs under IBM's Interactive Instructional Presentation System (IIPS) or any IIPS-compatible system, the vendor said. All courses may be leased or purchased.

The purchase price is $3,000, a spokesman for Advanced Systems said from 2340 S. Arlington Heights Road, Arlington Heights, Ill. 60005.



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Paint Firm Upgrades Hardware To Develop Application Software

MINNEAPOLIS — The need for increased on-line applications development was the driving force leading to a hardware system upgrade for a paint and coatings manufacturer here.

"The critical issue today is application software development, not computer hardware," James Seiberlich, vice-president of administration at The Valspar Corp. said. The firm installed a Sperry Univac 1100/60 system primarily because it could be used with the Univac Mapper software, a report processing package.

"To continue to be competitive in today's economy, it's necessary to develop ways to expand computer capabilities without a comparable increase in professional programming staff," Seiberlich said. "Mapper will enable us to achieve this objective because it is an immediate management tool which end users can use to do their own programming and develop their own application software."

John Stevenson, the firm's director of management information services, predicted use of Mapper will introduce a new area of application software development using non-data processing personnel at Valspar. "The demand for application software development far exceeds our available professional programming resources," he said. "We would have to double our 13-person programming staff to handle all of these applications using conventional application development approaches employing Cobol or other programming languages."

He suggested that end users' understanding of the business coupled with their developing their own application software "will result in more effective information systems as well as a continuing cost savings.

"We had some older series of Univac equipment," Stevenson said, and "we have used Mapper to rewrite our on-line applications so we could move them to the 1100/60." The 1100/60 was installed in place of a Univac 90/30, which had been in place since 1976, and a Univac 90/40, which had been brought into operation in 1979. The company had outgrown the capabilities of these systems, which currently are being used for order entry, inventory control, formula costing, financial and other on-line and batch applications.

"Mapper, of course, uses more computer resources than a conventional programming approach, which is more resource efficient," he noted. "But, in our view, this trade-off is more than justified by the greater economy, efficiency and effectiveness provided by the system."

According to Stevenson, one of the first uses of Mapper involved development by end users of a purchasing/raw material inventory control application while conversion was being made to 1100/60 on-line operations. In addition, Mapper was used to fine-tune and to implement an on-line cash management application.

John Stevenson (left), Valspar Corp.'s MIS director, discusses a new software program with James Seiberlich, Valspar vice-president of administration.

The firm plans to use Mapper for numerous applications in manufacturing, sales, research and development and other areas of company operations.

"We have 60 on-line terminals at plant and warehouse locations throughout the country. This will become our basic Mapper network," Stevenson explained. "We'll be teaching a whole new community of end users with the system, creating the opportunity for a wide diversity of software application development."

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Flexible DBMS Helps Builder Cope With Payroll

MINNEAPOLIS — Because so many unions are involved in the major construction projects of S. J. Groves and Sons Co. here, it is not unusual for an employee to work against five pay scales in a single day. So when Groves went looking for a data base management system (DBMS) in 1979, flexibility was high on its shopping list.

The critical application Groves needed to develop was an on-line, remote site, daily payroll reporting system for major construction sites in Atlanta, Chicago, St. Paul, Minn., and Bonneville, Wash. Groves, a large construction and earth-moving firm, used IBM's DL/1 DBMS with IBM's DMS on-line application development system running on a 370/138 computer. The company had recently upgraded to an IBM 4341 Group 2 computer under DOS/VSE.

The firm had used DL/1 for payroll, never making a full commitment to a DBMS. DL/1 was simply too hard to use, according to Ron Menough, the company's systems support supervisor.

DL/1 Found Rigid

"We found a certain rigidity with DL/1," Systems and Programming Manager Carol Stotts said. "Its hierarchical structure locked us into a certain way of doing things. When new requirements came up, it was very difficult to work them into the previous designs."

"IBM didn't support us that well or help us on DL/1, and that's why we didn't go any further on it," Menough said. "When it was first installed, you'd think they'd be here giving us direction, but they just let it die. They never came back in. They were not really trying to sell the account.

"We were up under DL/1 for three months and all we had on it was payroll," Menough added.

Choices Narrowed

After three months of study, including presentations from "three or four of the top DBMS vendors in the field," Menough said, Groves narrowed its choices to IDMS from Cullinane Database Systems, Inc., Cincom Systems, Inc.'s Total and DL/1. It settled on Cullinane's IDMS.

IDMS fit Groves' needs most effectively, Menough said. During each sales presentation, he said, the evaluation team gave the vendors' sales representative a hypothetical payroll problem. The IDMS representative, Menough said, "did not know what the problem would be and still solved it with ease. The IBM representative, in fact, had a hint of what the problem would be and still was not able to give us an effective solution."

Security was another area of concern for Groves. The original DL/1 files would have required writing separate security programs for each file. The IDMS subschema concept, which gives each user the precise view of the data base needed rather than the whole record, met the company's requirements.

In addition, IDMS automatically takes care of crashes and backups, a feature, Menough said, that DL/1 did not contain. "[With IDMS] we have had a couple of crashes and have recovered with no problem."

"We can back up selectively," he explained. "Previously, we had to take the data base down when we wanted to back up to tape, which made for a lot of downtime that we couldn't afford."

Menough added that IDMS is fully recoverable, with its own built-in backup and recovery techniques that eliminated the need for user-written programs.

The factor that ultimately sold the system, he said, was the IDMS interface to Groves' DMS on-line application development system. The interface is an intermediary program communicating between the DMS terminal screen and the IDMS data base. It lets users retrieve and update IDMS data bases using their existing DMS programs under CICS/VS. DMS can be used to map the screen, access files and do some editing, while the DMS interface accesses, reads and writes the data base.

The interface "has really helped us bridge the gap between IDMS and DMS programs," said Richard Lunden, assistant vice-president and director of management information services for Groves. "The bottom line is that we saved a lot of time."

Stotts called the interface "a great time-saver, eliminating the need to write more than a dozen new exit programs and make logic changes to another dozen existing exit programs to get us from the DMS screen to the IDMS data base." Without the interface, she said, Groves would have had to commit more than 200 man-hours to writing payroll programs in command level, and the company has no command-level programmers.

IDMS with its interface has significantly improved response time, Menough said. "I understand that the worst time under IDMS with the interface is better than what we experienced previously." A spokesman said prior response time was between seven and nine seconds, but under IDMS, it has dropped to four to six seconds at remote sites.

"We wanted something easy to create, and we got it," Menough said. "Our programmers really took off on IDMS."

38

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County Shines With System For Tax Collection Records

CITRUS COUNTY, Fla. — What does a county do when it suddenly finds itself with twice as many taxable land parcels on the same amount of territory?

That was the dilemma for Citrus County here, which experienced a 140% growth in its taxable property rolls in the matter of five years. From 54,000 parcels in 1977, the county has grown to include 130,000 taxable parcels this year. If current growth rates continue, there could be twice that many within the next five years, according to the county property appraiser.

Citrus County formerly had used a remote batch-processing system to handle record keeping and tax collection, according to Charles Allen, property appraiser for Citrus County. But the system was laborious and slow.

So in 1979 the county bought a Burroughs Corp. 1900 computer with the Oasis on-line property appraisal and tax collection system from American Management Systems, Inc. (AMS) of Arlington, Va.

The result has been a drop both in the time needed to create and change property records and the cost of maintaining the property data base. According to Allen, the average cost of information processing per parcel is 83 cents in Citrus County compared with $1.61 across the state. Recently, Citrus County began a program to finance system upgrades by offering its computer service on a time-sharing basis to other counties.

Citrus County is characterized by sharp market value differences, from low-price rural acreage to expensive property along 57 miles of ocean. The county sought a software package that combined integrated data base management and one-time data entry with flexible property valuation techniques and tax collection and distribution facilities, all in an on-line mode.

"We weren't very happy with our old batch system or with the others that were available," Allen said. "AMS promised to work with us to develop a system we could use. We've been very happy with the results."

The on-line features have enabled the property appraiser's office staff to dispense with the reams of paper that were once needed to process adjustments, Allen said. It has also enabled the county to maintain individual records for more efficient valuation.

"The old system tied us in to bulk assessment" in order to handle the volume of parcels, Allen said. "By keeping individual records, we can now run analysis or ratios a heck of a lot faster."

Despite the growth in work load, the staff in the property appraiser's office has increased by only five people to 22 employees. "To meet such an increased work load using the old batch system, we would have required at least 50 people and we still would have no guarantee that the job could be done," Allen said.

Terminals have also been installed in the planning and zoning, tax collection, disaster preparedness and land departments, making on-line property information available to others who might need it.

When the county decided to upgrade its computer facilities this year, it chose a path that would minimize the burden on the county budget.

"We wanted to upgrade but not to bear the brunt of the cost," Allen said. "We had several requests to share our computer. So we decided to take some of the more compatible surrounding counties on-line."

Property assessing and tax collection departments from Hardee and Sumter counties were added to the shared system this summer.

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Company Fuels DP With System Conversion

OKLAHOMA CITY, Okla. — Growth companies that double their revenues in a single year can easily lose control of their exploding operations.

Such a potentially volatile situation faced Amarex, Inc., a gas and oil exploration firm here whose revenues, following several consecutive years of growth, spurted from $20 million to nearly $40 million during fiscal 1982. Clearly, the company had to tailor its DP resources to meet its growing needs, according to Peter McCook, senior vice-president of administration at Amarex.

Amarex had outgrown the punched card batch system installed five years earlier, so in 1980, the company began to study alternatives.

"We recognized the validity of our DP peoples' complaints about poor service, and we could also see tremendous future growth ahead with the decontrol of deep natural gas," explained Executive Vice-President LeRoy Belcher. "After rating several systems, we selected IBM because it was apparent the vendor could provide us with the right equipment and support to enhance outgrowth."

The system's software environment included IBM's DOS/VSE, CICS, ICCF and DL/1 products.

"We didn't want to reinvent the wheel, so we used existing applications software with minor modification where we could," McCook said.

Preparing for Conversion

To prepare for the IBM conversion, McCook and his systems people spent six months preparing a business systems plan that involved identifying and defining the business process and then determining the optimum sequence of system implementation.

The business systems plan, McCook recalled, showed the need for a data base system, and thus the system was set up with 12 data bases logically connected to provide a solid information foundation, communicate as needed and be easily accessed by qualified personnel.

The next step in the planning procedure was modeling the business function and processes in the data base, spotting and correcting flaws and producing the basic design for the system.

Converted Payables First

After installation of a 4331 Model Group 2, Amarex converted payables first, due to the company's rapid growth, the volumes of paperwork generated and the need to feed incoming information to other systems.

Recent growth convinced Amarex to upgrade to a 4341 host processor because its expanded memory could more suitably meet future needs.

Major applications running currently on the system include a lease-hold system that keeps track of mineral rights leases obtained from farmers and ranchers for future activity, a budgeting system that tracks drilling projects precisely and enables executives to monitor their expenses via terminals at their desks and an accounts payable system that feeds data into the budgeting system.

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Bank Saves Time With Worldwide Credit Net

NEW YORK — The Chase Manhattan Bank here has streamlined its international credit approval and reporting service by implementing a worldwide electronic credit information network. The network provides the company with word and data processing and acts as a global data base to generate management information.

Overseas lending makes up a dominant part of Chase's total loan portfolio. But until the advent of the credit information system, establishing a credit line was a time-consuming manual process, according to Frederick W. Siegle, vice-president of the International Department's Technical Services Division.

"Each time a client asks for new credit or for a loan based on an existing credit line, the bank needs to review that client's credit situation," Siegle explained. "Credit facility report [CFR] processing was a monumental task, creating a veritable paper explosion" that amounted to some 360,000 page updates annually.

Problem Geography

An avalanche of paperwork was not the only problem. Geography slowed the process even more. The international department has some 100 offices throughout the world. Draft CFRs for loans that exceeded the account officer's lending authority had to be mailed for approval, sometimes halfway around the globe, to area or head office management. As a result, the credit commitment process could take as much as six months.

Chase Manhattan installed a credit information network based on Wang Laboratories, Inc. Office Information System OIS 140 minicomputers. "I came to the conclusion," Siegle said, "that Wang was the better way to go. The OIS, which appeared on the market at that time, gave us the ability to do word processing and data processing on the same piece of equipment." Equally important was "worldwide service and support."

In eight months in 1980, the OIS systems with a custom-designed set of programs were installed in 11 key locations, including London, Paris, Singapore and Tokyo. By the end of 1981, 19 more offices were part of the network, Siegle said. Wang's electronic mail package, Mailway, was successfully tested and installed in January 1982. "We plan to install Mailway over our entire network," he said.

In a further refinement of the credit reporting system, credit data from branch offices will feed into three Wang VS 80 computers acting as intermediate data collection and processing centers in the area offices for Europe, Asia and the Western hemisphere. From there, the information will be communicated to New York, where a VS 100 will maintain the central international credit data base.

The CFR network also represents an automated office network that can be used for other applications. Chase's "country of risk system," for example, will soon be running on the network. Known as Cors, this system keeps track of the economic, social and political factors within a country that might affect a borrower's ability to repay and draws on some information contained in the CFR bank, Siegle said.

The network will deliver management information both at the head office and branch levels, he added.

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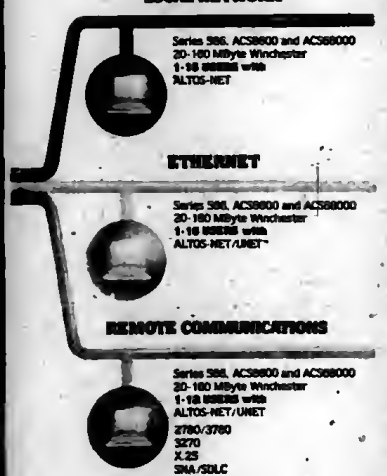

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			North Central	Northeast	South	West
City Size						
Over 500000	Quantity	Total	17057	15045	13277	12603
	$ Amount	Total	26757.94	24040.36	18853.55	16777.59
		Percent of Regional Sales	55.8	42.9	47.4	50.8
50000 to 500000	Quantity	Total	9012	13509	13280	11605
	$ Amount	Total	13787.06	22071.22	20954.00	14210.25
		Percent of Regional Sales	28.7	39.4	52.6	43.0
Under 50000	Quantity	Total	4048	5131	None	1811
	$ Amount	Total	7428.34	9984.05	None	2034.05
		Percent of Regional Sales	15.5	17.7	None	8.2

Garment Company Finds Well-Suited System

LOS ANGELES — It would be easy to keep an inventory of clothing if people did not come in different sizes. But when Howard Mahler, president of Mahler Sales Co., decided to computerize his belt manufacturing firm 2½ years ago, he had to deal with that basic anatomical fact as well as his concern for keeping a current inventory of styles and colors.

Mahler had been using a Burroughs Corp. system for accounting and inventory management since 1978. But the computer proved too small for his expanding business. Spurred by a referral from a friend, he contacted Cybertec, Inc., a local OEM for Alpha Micro, Inc., which specializes in small systems for garment manufacturing and medical billing. For the past two years, Mahler and Cybertek have worked together to develop an application package that Mahler says is ideal for his business.

The system, called Cyberam, is based on an Alpha Micro AM-1040V minicomputer with 32M bytes of disk storage, two Soroc Technology, Inc. terminals, a Texas Instruments, Inc. 810 printer and an Epsom America, Inc. printer.

The computer now handles nearly all financial aspects of Mahler's $1.5 million annual business. System features include apparel inventory with color/size subfields, bill of materials, order processing, parts explosion, work in process, a piecework payroll for 60 employees and accounting functions.

"I wanted a system that would do the things I wanted to do in the ways I wanted to do it," Mahler said. "Other vendors said they couldn't give me the special functions I needed or that they were too expensive. With Cybertek, I supplied the needs, and they supplied the programming. Now I couldn't do without it."

Special Features

Two special features of Cyberam are the apparel inventory and parts explosion functions, Mahler said. The color/size subfields of the inventory package enable him to keep an inventory of each product style by size and color. The menu format is driven by a 10-key pad, which he said is so simple that nearly anyone can use it.

A grid screen makes it easy for the user to see which stocks are running low. "I can find out almost immediately which styles are selling, and what styles I should eliminate," Mahler said. "This information alone used to take two days to compile and by then it would be outdated."

The parts explosion function helps Mahler order the materials needed to fill an order without overstocking raw materials, he said. When an order is received, the operator breaks it down into sizes and colors and enters the information into the system. The computer determines which raw materials are needed and compares those needs to the materials in stock. If the order would require inventories to fall below a specified level, the computer flags the shortfall.

Tedium Eliminated

Mahler said the system has helped him eliminate many tedious accounting functions. "I used to have three girls entering orders all day," he said. "Now one person can enter all the orders in one hour."

And recently, Mahler said, it has helped him occasionally to eliminate the 44-mile round trip from his home to the office. This year, Mahler bought an interface between his Apple Computer, Inc. Apple II home computer and the Cyberam minicomputer at his office.

When daily routines are completed, the Cyberam is set to work generating a series of management reports, including account invoices and orders, orders within three days of cancellation, orders in-house, a notes field and purchase orders generated.

The processing is done after work hours and stored in the system. Each morning, Mahler dials a special line and connects his Apple to the office computer to review the previous day's operating activity.

If everything is going well, Mahler said, he may take a day off. "The instant information I get at work is still available to me on the days I can't get into the office," he said.

Directory Lists Micro Suppliers

DELRAN, N.J. — Datapro Research Corp. has released a directory of 2,000 companies that supply microcomputer equipment and software.

Who's Who in Microcomputing '82 reportedly contains current profiles on vendors of computer systems, peripheral equipment and system and application software programs; consultants; maintenance and service companies and accessory vendors and suppliers. Each company profile includes the names of major contacts, size and age of the company, geographic and sales concentrations and descriptions of product lines.

The 500-page directory is available for $59 from 1805 Underwood Blvd., Delran, N.J. 08075.

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Growth of Knowledge-Based Systems Opens

By Ray Weinstock
Special to CW‡

"The battlefield lines are about to be defined," according to Mark Miller, executive vice-president of Computer Thought Corp. in Plano, Texas. The battle is for the market of knowledge engineering products and services, a market expected to reach the multibillion-dollar level before the end of the decade.

While this emerging new technology is radically different in objectives and methods from traditional data processing, surprisingly few corporations and individuals are aware of its impact and possibilities.

Unlike conventional DP programs that run in an algorithmic step-by-step way of solving strictly numerical problems, knowledge-based systems are meant to solve far more complex situations involving uncertainty, human judgment and experience. Such situations include medical diagnoses, emergencies in nuclear power plants, choosing the right loan or insurance for a client — situations in which brute amounts of raw data just won't do to decide a course of action. Several dozen knowledge-based systems are already in operation in a wide variety of specific areas giving interactive "expert" advice to users or even controlling machinery as a human would.

Essential Question

"Imagine having not one, but several of the best experts in your company available around the clock in all your branch offices simultaneously. What would be their value to your business?" asked Jerry Kaplan, vice-president of business development at Teknowledge, Inc., a Palo Alto, Calif., knowledge engineering firm. His is an essential question in the criteria for deciding for or against a knowledge-based system.

Currently, a knowledge-based system development and implementation may cost from one million to several million dollars, but 10 to hundreds of million dollars of payoff can be realized once the system is in operation. Some payback times have been as short as a few weeks. Development times, on the other hand, range from about six months to several years, depending on the complexity of the task, requiring a substantial commitment of manpower and other resources.

Because knowledge-based systems

Lisp the 'Lingua Franca' of AI

A list manipulation computer language known as Lisp is the "lingua franca" of artificial intelligence, but some other conventional languages could be used to implement a knowledge-based system. Similarly, the current existing IBM or Control Data Corp. hardware of an installation could be used instead of the Lisp-oriented computers available in the $50,000 to $100,000 range.

Specialized Lisp hardware is currently available from Xerox Corp., Digital Equipment Corp., Symbolics, Inc. of Cambridge, Mass., or Lisp Machines, Inc. of Culver City, Calif. Every case should be studied separately, but in most situations a Lisp-oriented computer is the most cost-effective solution.

"Most of our software tools that aid in building and testing rule interpreters and knowledge bases are themselves built for Lisp development in AI-oriented computers," according to Robert Engelmore, director for knowledge systems development at Teknowledge, Inc. "Despite this, there is nothing that would preclude using other languages or equipment. It is a question of cost and the savings that can be realized from the immediate availability of these tools," Englemore continued.

There are several successful attempts to devise very generalized knowledge-based systems such as Emycin, an outgrowth of Mycin, an expert system to diagnose infectious diseases. Emycin (for Essential Mycin) provides an important time-saving bridge to create knowledge bases in various domains. According to Dan Marro, manager of advanced development at NCR Corp. in San Diego, Calif., "The challenge is to generalize expert systema so that the infusion of knowledge bases becomes more time- and cost-effective."

Within the next two years, more powerful knowledge-based systems building tools could reach a secondary market, such as consultants and software houses, therefore generating additional activity and profits. Although knowledge engineering is still at an early stage, forward-looking DP professionals, programmers and systems analysts would do well to explore the possibilities by reading and obtaining some training in the area such as a hands-on tutorial available for a popular microcomputer. Also, in the near future, less expensive Lisp machines should be available to more people, perhaps in the $15,000 to $20,000 price range, therefore opening vast new possibilities to those interested in experimentation and development of knowledge-based systems.

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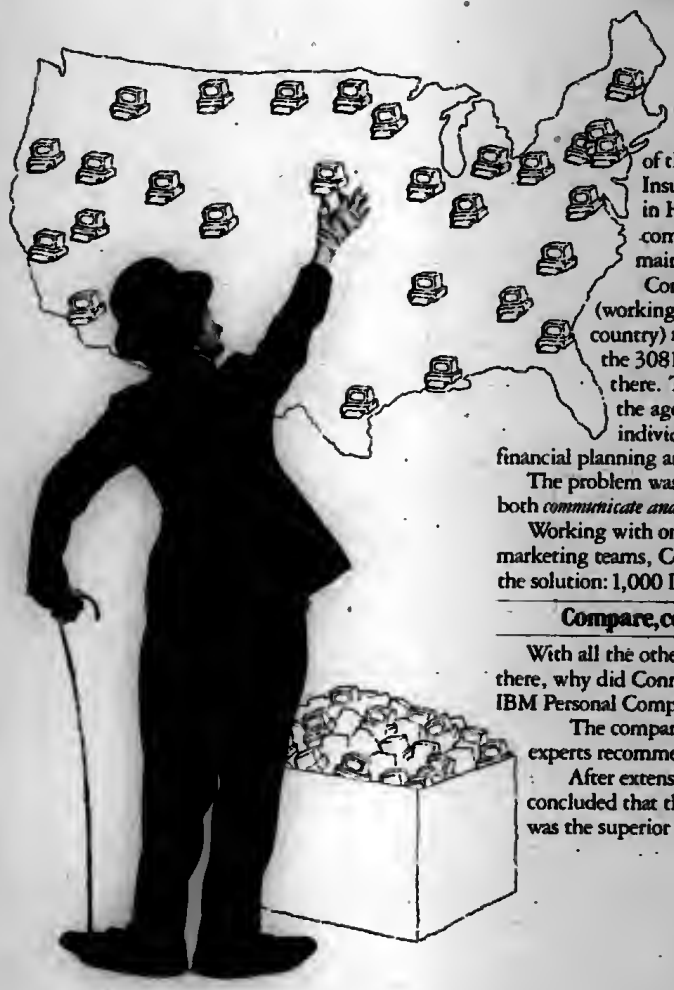

The corporate headquarters of the Connecticut Mutual Life Insurance Company is located in Hartford. So is its central computer, an IBM 3081 mainframe.

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Market for Artificial Intelligence

generally require extensive customization to client needs, only high-value systems are practical at this time. But, again, in many organizations there are significant problems that justify the cost and risks of building a knowledge-based system when no alternative traditional DP solutions exist. The value of such a system in an organization is therefore one important issue before considering any further steps. Another, is the availability of human experts in your corporation capable and willing to donate their time and expertise to a knowledge engineer during lengthy periods.

Central to knowledge engineering is the way in which expert knowledge is extracted, stored and manipulated. Although other forms of representation exist, knowledge is usually stored in hundreds of "IF . . . THEN . . ." capsules, also known as rules. It is this collection of rules that constitutes the knowledge base in a specific domain. A rule interpreter program, also known as an inference engine, will navigate through the knowledge base much as a human would scan or reason through his own rules of experience.

Each rule can have one or more statements in its IF part and include one or more statements in its THEN part. If all the premises of the IF part of a rule hold true, then the conclusions in the THEN part are true and the rule is said to "fire." In turn, the conclusion of a certain rule may exist as the premise of another rule that may itself "fire" and ignite other rules successively until a final conclusion is reached. This would be the conclusion of the last rule that "fired." This form of operation of the rule interpreter program, from known facts to final conclusions, is referred to as follow-chaining, data-driven or antecedent control strategy.

Another Strategy

A more complex control strategy is known as backward-chaining, goal-driven or consequent reasoning. Here, the rule interpreter program traverses the knowledge base of rules backwards, in a sense from

(Continued on Page 42)

Glossary

Artificial Intelligence: The subfield of computer science that is concerned with symbolic reasoning and problem solving.

Knowledge Engineering: The engineering discipline whereby knowledge is integrated into computer systems to solve complex problems normally requiring a high level of human expertise.

Knowledge Systems: Computer systems that embody knowledge, including inexact, heuristic and subjective knowledge; the results of knowledge engineering.

Knowledge Representation: A formalism for representing facts and rules about a subject or specialty.

Knowledge Base: A base of information encoded in a knowledge representation for an application.

Inference Technique: A methodology for reasoning about information in a knowledge representation and drawing conclusions from that knowledge.

Task Domain: An application area for a knowledge system, such as analysis of oil well drilling problems or identification of computer system failures.

Heuristics: The informal, judgmental knowledge of an application area that constitutes the "rules of good judgment" in the field. Heuristics also encompasses the knowledge of how to solve problems efficiently and effectively, how to plan steps in solving a complex problem and so forth.

Production Rules: A widely used knowledge representation in which knowledge is formalized into "rules" containing an IF and a THEN part (also called a condition and an action). The knowledge represented by the production rule is applicable to a line of reasoning if the IF part of the rule is satisfied; consequently, the THEN part can be concluded or its problem-solving action taken.

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System Beefs Up Cattle Breeding Records

KINGSVILLE, Texas — That hamburger you had for lunch may have passed through a food processor, but researchers here at the Santa Gertrudis Breeders International are using a processor of another kind — a small business system — to record information about America's first homegrown breed of beef cattle, the Santa Gertrudis.

The 1M-byte IBM System/38, which is equipped with four 6M-byte disk drives, stores ancestry, breeding and performance information about the breed and processes registration certificates submitted by some 4,000 member ranchers. About 400,000 cattle are registered in the system.

The first Santa Gertrudis bull, a mixture of the Shorthorn and Brahman breeds, was produced in the early 1900s by the King Ranch. That first Santa Gertrudis — now stuffed and mounted at the King Ranch — today stands in the shadow of terminals linking the ranch with the breeders' association.

Whenever a Santa Gertrudis is sold, the breeders association issues a new registration certificate. The System/38 cuts down the time necessary to process the certificate by automatically verifying, cross-checking and printing a new certificate, according to Dr. W. M. Warren, executive director of the breeders' association.

Each certificate contains such information as ancestry, owners and performance data. The association often sends out hundreds of certificates at a time to a big ranch, Warren noted.

Thousands of sales are recorded each month. And thousands more Santa Gertrudis calves are born and registered each year. Data on each animal is stored in the processor under a registration number, an animal number, breeder herd number or owner herd number. Warren noted that the System/38's data base capabilities enable the association to find information and send out reports fairly quickly.

The System/38 can also be used to find out how many offspring were produced by a particular bull or cow. The association plans to use the system to produce a list of a particular bull's offspring, so breeders can get an idea of the quality of calves which can be expected.

Other plans include a program to add performance information, such as weaning weight, rate of weight gain and potency. That information will be combined into an estimated breeding value.

This performance information is valuable to breeders, Warren explained. "Say you had two bull calves that weaned at 700 pounds, which is very good. If you know the second one had 10 half-siblings that also weaned at 700 pounds, you'd have more confidence in the second because of its solid parentage."

Mart Emerging For AI Products

(Continued from Page 41)

conclusions to initial premises.

Some commercial knowledge-based systems in operation use backward chaining, others use forward chaining, and in some cases, a combination of both methods is applicable. Also one should notice the case of maintenance provided by the rules of the knowledge base. Changing one statement might change an entire "reasoning" pattern.

Certainty Factors

In addition, certainty factors can be associated to each "IF ... THEN ..." rule to simulate the type of semi-logical response that characterizes human thinking. In this way, the knowledge-based system can either conclude or support a hypothesis and inform the user of its degree of certainty as a human expert would do in recommending, suggesting or diagnosing.

Another striking characteristic of a knowledge-based system is the capacity to explain its line of reasoning. Why has a certain question been asked you? How was a certain conclusion reached? These inquiries can be made while the rule interpreter is in operation, thus lending credibility to the contents of the knowledge base and how it is being used. It is apparent that a human expert would have serious difficulty answering such questions about its own line of reasoning.

Currently, there are only a few hundred experts in knowledge-based technology worldwide. As the market grows, so will the demand for trained professionals. At any rate, not less than six months should be invested by a traditional DP professional in obtaining a basic training in knowledge engineering. Several training courses are available from companies such as Smart Systems, Alexandria, Va.

Weinstock is a senior systems analyst at Rand Information Systems in San Francisco and a member of the American Association of Artificial Intelligence.

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CPUs Process Ordinances for Mormon Church

By Paul Gillin
CW Staff

SALT LAKE CITY, Utah — The sanctum of a temple is the last place most people would expect to find a computer. But in the Church of Jesus Christ of Latter-Day Saints, better known as the Mormon Church, computers are now becoming an essential part of certain ceremonies.

Since February 1981, the church has used computers in four temples around the state of Utah and one in Atlanta to perform ordinances, important tenets of the Mormon church. Ordinances include baptisms, marriages and certain other covenants performed by church members acting as proxies for the deceased members who were not baptized by the church prior to 1830, when the Mormons believe Christ returned to Earth.

Anyone who has ever lived is theoretically eligible for ordinances, so the data base of names the church uses is understandably immense, explained Don LeFevre, director of press relations for the church.

Records Scoured

In parishes around the world, Mormon volunteers scour records of churches and courthouses dating back to the Middle Ages and record names onto microfilm. The films are sent to church headquarters here where volunteers read and process every name in a procedure called records extraction.

Lists of names are recorded on magnetic tape and sent to the five temples in the U.S. that house computers packaged specially for the procedure. A typical small configuration, such as the one in the Atlanta temple, includes two 512K-byte General Automation, Inc. 16240 CPUs, 240M bytes of disk storage, 25 Televideo, Inc. terminals, 15 Mag-Tek, Inc. magnetic card readers, 10 Alpha-Com, Inc. 40-col. printers and two Tally Corp. 1605 dot matrix printers, according to Randy Bliss, team supervisor and chief designer of the systems.

A large configuration, like that in Provo, Utah, includes four 384K-byte CPUs, 480M bytes of storage and 40 terminals. Software was developed by the church.

A church member in good standing is issued a "temple recommend" — or card with a magnetic stripe — which contains certain vital information about the member such as name and birth date. When the member goes to the temple to perform an ordinance, he inserts the card into a slot. The computer matches the member's name with the computer files and issues a piece of paper bearing the name of the dead for which the ordinance is to be performed.

"The living person is basically a stand-in for a baptism," LeFevre said. When the member reaches the baptismal pool, "The name of the deceased pops up on the terminal and the living person is baptized by proxy."

The ceremony takes only a few seconds while a brief prayer is said and the member is baptized, he said. Afterward, the completed ordinance is processed through the computer and a mag tape is sent back to Salt Lake City, where the information is stored on the church's IBM 3081 mainframe, according to Pete Pratt, manager of systems development.

A large temple may process 10,000 ordinances per day, Pratt said. Many younger members will be baptized 20 or 30 times during the course of a visit.

The data base from which the information is drawn is linked to the church's genealogical library, housed deep inside a Utah mountain where it is intended to be safe from disaster, LeFevre added. The information is also available to church members who wish to do genealogical research, he said.

Currently, there are 22 Mormon temples in the world, with another 20 under construction, LeFevre said. All future Mormon temples will include the computerized ordinance system, and the network will gradually be expanded to include the 22 existing Mormon temples in the country, Pratt noted.

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New Hardware, Software Technologies Spur

By George Schussel
Special to CW‡

The products available in the data base/data management market have evolved dramatically since 1980.

New hardware and software technologies have changed the character and number of products available for purchase more (in a shorter period of time) than the oil embargoes changed the nature of products offered by automobile companies. The oil crisis hit the auto makers; the productivity crisis has hit the software suppliers market.

Someone evaluating data base/data management products in the '70s, or even as late as 1980, could narrow the choices down to a few. If you were a non-IBM shop, you simply took the data base management system (DBMS) offered by the hardware vendor. If you were an IBM shop, you could choose IBM's IMS or DL/1 products or choose products such as Software AG's Adabas, Cincom Systems, Inc.'s Total and Cullinane Database Systems, Inc.'s IDMS. Today there are 75 qualified software vendors marketing DBMS packages for all types of computers from micros to mainframes. These include hierarchical, inverted, Codaysl, master/detail and relational-type systems.

Another major difference from two years ago is that the Codasyl issue has become most unimportant in the marketplace. With most of the major users having already signed up for a DBMS product, and 85% of them not using a Codaysl product, it seems clear that the Codasyl data definition language and data manipulation language standards, at least in their current form, will not be significantly adopted by the marketplace.

The old-fashioned DBMS with its required high-level technical data base administration gurus and large mainframes has been ruled nonresponsive by the marketplace. Successful vendors of this type of product have changed directions, providing a sophisticated set of high-level language tools that give the data base designer the control needed to build large DBMS environments.

Focus of Large Shops

For large shops, the focus today is on evaluating a complete set of integrated data management products of which the DBMS is only one piece. A complete set of high-level integrated data management tools will typically lease for $300,000 or more on a mainframe environment and should include:

- A DBMS offering data independence.
- A data dictionary defining and controlling the data environment.
- A query language allowing user personnel access to the data base.

Much of the marketplace action is now going to minicomputer-based products, many of which use the relational data model. Data bases, query languages and data dictionaries are commonplace in this environment.

Comprehensive DBMS products offered by minicomputer manufacturers include Hewlett-Packard Co.'s Image, Data General Corp.'s DG/DBMS, Digital Equipment Corp.'s VAX Information Architecture and Prime Computer, Inc.'s Prime DBMS.

The software license fees for the minicomputer products are typically less than half the price of the comparable license fees for the large-scale IBM environment. On the other hand, the

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Data Base/Data Management Product Growth

capability of the mini DBMS software is good, 60% to 80% of the capability inherent in mainframe software.

Rapidly coming up to fill the "compact" gap below the traditional minicomputer products are new products evolving from the keyboards of microcomputer gurus. Examples of this type of product including Micro Data Base Systems' MDBS, Stoneware Microcomputer Products, Inc.'s DB Master and Software Publishing Corp.'s PFS.

The relational data base model has received much attention recently. This view of data, growing out of the work of IBM's Dr. Edgar Codd, has been adopted not only by IBM (with its Structured Query Language/Data System product), but by a host of other hardware and software vendors.

True relational or relational-like products being marketed include Tandem Computer Inc.'s Encompass, Relational Software, Inc.'s Oracle, Relational Technology, Inc.'s Ingres, IBM's System/38 Data Base, Perkin Elmer Corp.'s Reliance, Sperry Univac's Mapper and several others.

The relational model seems to be preferred by the data base machine vendors, notably Britton Lee, Inc. Britton Lee's products are being manufactured for several software houses that build front ends and offer the entire system to users. Intel Corp. has also announced a data base machine.

Within the next year or two there will be at least a dozen serious relational data base products available for the prospective user. The answer is still unknown to the query, "How well will the relational data base model work on live production-type data bases?" The relational DBMS products work for query and browsing. Most consultants feel nervous about recommending them for large multibillion character production-oriented data bases. This issue should become much more clearly defined over the next two years.

User-Oriented Products

The "user-oriented" DBMS product is also getting a lot of attention now. Typically evolving out of a simpler file management language developed in the 1970s, these languages offer high-level DP facilities to "nonprogrammer" users and include features such as screen mapping and data dictionaries.

The user of one of these language facilities has data base, query, report generation, data dictionary and application generation facilities integrated into a single product from one manufacturer. While this type of product tends not to offer the detail control afforded by the vendors of the more comprehensive DBMS products, it offers simplicity in training and installation instead.

A large number of top-quality software products are available today. A logical approach for choosing a product or set of software tools is to determine first what type of product is required: microcomputer-based, minicomputer-based or mainframe; or user-oriented or DP-oriented. Once the general functional type of system is determined, the pursuit of individual packages can then be narrowed down for study in greater depth. Any possible way of streamlining the analysis should be used whenever possible.

Schussel is president of the Lynnfield, Mass.-based Digital Consulting Associates, Inc. and chairman of the National Data Base Management Symposium.

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Dec. 6-10, Washington, D.C. — **Structured Analysis Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Dec. 7-9, Chicago — **First Annual Conference on Computers in Science.** Contact: American Association for the Advancement of Science, 1515 Massachusetts Ave. N.W., Washington, D.C. 20005.

Dec. 7-9, Anaheim, Calif. — **Dexpo West '82.** Contact: Expoconsul International, Inc., 19 Yeger Road, Cranbury, N.J. 08512.

Dec. 8-9, Dallas — **Business Expo.** Contact: International Business Exposition, Inc., 702 E. Northland Towers, 15565 Northland Drive, Southfield, Mich. 48075.

Dec. 8-9, San Jose, Calif. — **Compusource '82.** Contact: Norm DeNardi Enterprises, Suite 204, 289 S. San Antonio Road, Los Altos, Calif. 94022.

Dec. 8-10, Washington, D.C. — **Financial Information Systems.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

Dec. 8-10, San Francisco — **DP Operations Today: Effective Scheduling and Console Operation.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 8-10, Washington, D.C. — **Data Base Management Systems: Concepts and Guidelines.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 8-10, Washington, D.C. — **Office Automation: Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 8-10, Washington, D.C. — **Communications Satellite Systems — The Earth Station: A Practical Approach to Implementation.** Contact: George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

Dec. 8-10, Boston — **Designing Controls Into Computerized Systems.** Contact: EDP Auditors Association, P.O. Box 516, Boston, Mass. 02102.

Dec. 8-10, New York — **Microcomputers and the Internal Auditor.** Contact: EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Dec. 9-10, Summit, N.J. — **IMS Data Communications.** Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Dec. 9-10, Los Angeles — **Data Communications: Advanced Concepts and Network Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 9-10, New York — **Software Conference Exclusively for Financial Institutions.** Contact: Barbara Dales, Gralla Conference, 1515 Broadway, New York, N.Y. 10036.

Dec. 9-11, Marco Island, Fla. — **CAD/CAM: The Rewards and Risks.** Contact: Computer Technology Group, 310 S. Michigan Ave., Chicago, Ill. 60604.

Week of Dec. 12

Dec. 12-14, Andover, Mass. — **Institute for Graphic Communication.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Dec. 13, Smithfield, R.I. — **Theory Z.** Contact: The Center for Management Development, Bryant College, Smithfield, R.I. 02917.

Dec. 13-14, New York — **Data Communications: Advanced Concepts and Network Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 13-14, Baltimore — **Fundamentals of Data Processing for the Non-Data Processing Executive.** Contact: Center for Management Development, College of Business and Management, College Park, Md. 20742.

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Dec. 13-14, Houston — **Networking, Protocols and Standards.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 13-14, Los Angeles — **Artificial Intelligence.** Contact: Data Processing Management Association, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Dec. 13-14, Chicago — **Software Project Management.** Contact: Digital Equipment Corp., Educational Services, Seminar Programs, 12 Crosby Drive, Bedford, Mass. 01730.

Dec. 13-14, New York — **Introduction to the Unix System.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Dec. 13-15, Arlington, Va. — **Simulation Management Statistics Computer Science.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Dec. 13-15, Washington, D.C. — **Contracting Out "How To."** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

Dec. 13-15, Washington, D.C. — **Advanced Statistical Analysis System.** Contact: Registrar, Applied Technology Associates, Inc., Suite 1418, 1710 Goodridge Drive, McLean, Va. 22102.

Dec. 13-15, Washington, D.C. — **International Conference: Office Automation for Management Productivity.** Contact: Office Automation Society International, P.O. Box 31, Washington, D.C. 20044.

Dec. 13-15, New York — **DP Project Management: A Practical Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 13-15, Las Vegas — **DP Contingency Recovery Planning/EDP Auditing/Facility Design.** Contact: Education Department, Data Processing Security, Inc., 200 E. Loop 820, Fort Worth, Texas 76112.

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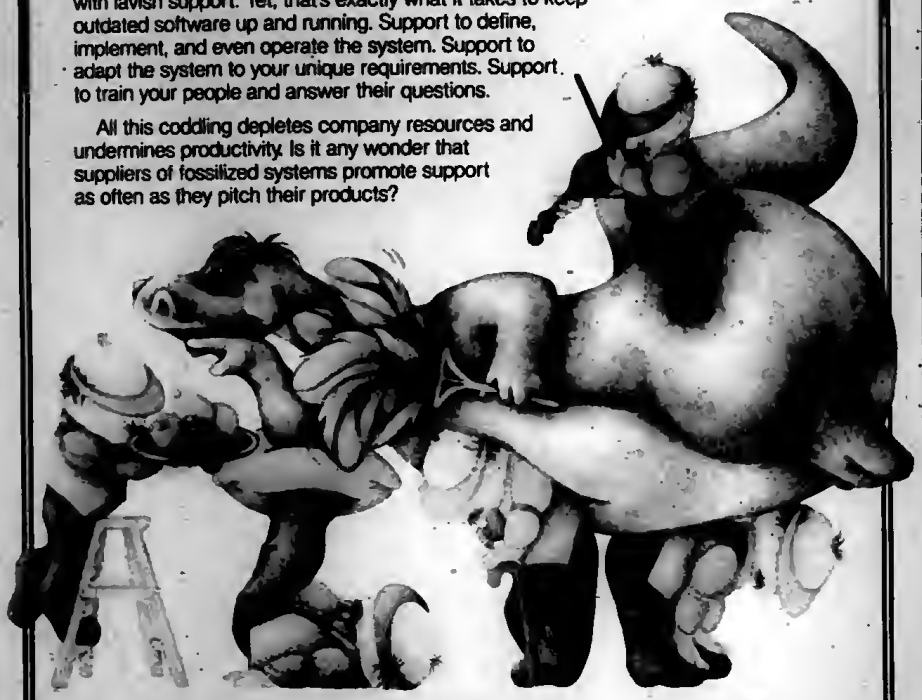

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Dec. 13-17, San Francisco — **CICS Internal Architecture.** Contact: David Shapiro, Sys-Ed, One Park Ave., New York, N.Y. 10016.

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Dec. 13-17, New York — **Workshop in Data Base Audit & Control.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

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Dec. 14-15, Andover, Mass. — **Business Applications for Computer Graphics.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Dec. 15, New York — **Files on the Unix System.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Dec. 15, New York — **CICS User Group Meeting: CICS Application Development System.** Contact: Teltech, 548 Fifth Ave., New York, N.Y. 10036.

Dec. 15-17, San Francisco — **Integrating Office Automation and DP Systems: Effective Strategies.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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EDITORIAL

Computer Crime Skeletons

Keeping computer crime skeletons in corporate closets is an accepted practice. "Mum's the word" is an attitude considered by corporate powers to be the wisest way to handle occurrences of computer abuse, computer fraud and other security breaches.

However, keeping computer crime under wraps is a mistake. It hinders the efforts of both the security community, which is looking for ways to stop DP abuse, and of those attempting to pass computer crime legislation.

Companies hit by computer crime believe that the less the public knows about their misfortunes, the better it is for business. Certain industries, particularly banking, are especially sensitive to a public airing of DP abuse. Banks fear the public will lose trust and shy away from doing business with, for example, an institution whose assets have been diminished by an illegal electronic funds transfer.

Businesses' hesitance to publicize incidents of computer crime is understandable. The public generally dislikes computers. It has been complaining for years about how they foul up utility bills and bank statements, how they fail to send out checks correctly and how they mess up charge card transactions.

People who perpetrate computer crimes are not seen by the general public as criminals, but are perceived as antiheroes who have succeeded in "beating the system."

Business responds to this misguided attitude by covering up incidents of computer abuse. Ironically, by masking the crime and shutting the public door, business only furthers the mystique associated with computers.

After all, why would a bank or other institution choose to camouflage the details of a crime unless the tools and the criminal were too powerful to handle in public?

Companies should worry less about public perception and instead concentrate on a crime's ramifications. By censoring information on a computer crime, business not only perpetuates public ignorance, but denies professional investigators the data needed to track down and prevent future DP-related abuses.

Publicizing the details of a crime and educating the public would also enlighten the courts as to how damaging these crimes are and perhaps increase the severity of the now soft sentences imposed on most computer criminals.

Granted, bringing the facts of a computer crime into the cold light of public scrutiny is embarrassing and might hurt business in the short term. In the long term, however, public awareness and education is the best weapon business has to fight a problem that has become rampant.

DATA PAST

Five Years Ago
Nov. 28, 1977

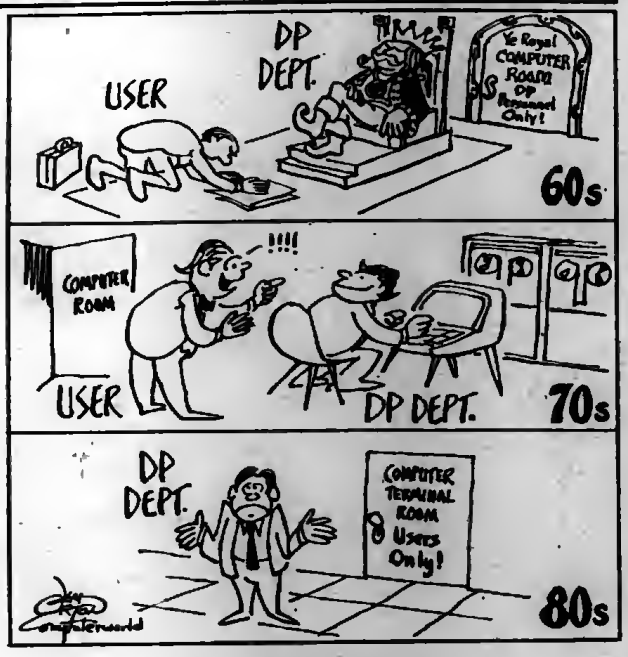
NEW YORK — IBM officials apparently recognized as early as 1968 that tying in software and services with the price of a CPU was illegal under U.S. antitrust law, although the announcement to unbundle was not made until June 23, 1969.

IBM memoranda supporting this charge was entered into the U.S. vs. IBM antitrust trial records in court here in spite of the efforts of IBM to keep the memoranda out of the public eye.

Ten Years Ago
Dec. 6, 1972

DOVER, Del. — The director of data processing for the state of Delaware charged IBM with trying to ruin his career because he chose another source for his computer equipment.

"On the morning of Nov. 14, an IBM representative came to my office and, in the presence of witnesses, informed me that I was 'finished' in the state," Arthur Hill, director of central data processing for the state, explained.



LETTERS

Paying Attention

After reading the article "Inattention to User Needs Cited for DP's Power Slide" [CW, Nov. 15], I began to wonder if *Computerworld* is paying attention.

I've spent most of the past 20 years attempting to overcome the very things the author and Jaime Jusidman are trying to promote in that most inappropriate piece. I fully agree with and support the notion that we must be more responsive to the needs of the user community, but certainly not for the sake of restored power.

Isn't our charter to provide a service to management and the operating sections of our organizations? Aren't we supposed to assist our peers, to facilitate the functions that they direct? Can we be concerned with our "power slide" and still provide a level of service that will contribute to the common good? We appear to be at odds with our purpose.

Has the "witch doctor" syndrome become so commonly accepted that we now openly concern ourselves with the erosion of our power? Why don't we change the focus to value? If we display the ability to perform our information management function well and also use our diverse knowledge in support of the organization, our participation on a broader scale will be encouraged.

Let's increase our value and see what place we can earn in the organization. We've spent too many years in conflict with the people we have been paid to help.

Far too many of us have used the mystique surrounding our work as a weapon. The dissolution of trust we experience can be traced to that problem and is the single major cause for the unfortunate position in which we currently find ourselves. Do you expect power to supersede trust?

It's not a power slide; it's a lack of trust. I'm sorry to say an earned lack of trust that left unattended will continue to cause the strife that Jusidman mistakenly attributes to the erosion of power.

We should not be concerned with any other power than what is required to operate our equipment. If we increase our value by providing greater support, everyone wins. If we continue to beat our users with technology and be concerned with power, we will perpetuate the very problem we are trying to solve.

The choice is ours.

Andrew Puglise
Hawthorne, N.J.

'Minor Nuisance'

Jack Stone's column "Closing the Door to Computerized Junk Mail" [CW, Nov. 1] fails to establish that computer-assisted fund raisers are anything more than a minor nuisance.

To refer without support to "Intimidation and/or Intrepidation" and to state blandly a 3% probability of being "nailed" is to ignore the existence of an Intelligence at the receiving end of what he justly refers to as "computer-generated garbage."

As only the most foolish or gullible among us are taken in by the political version of "You have already won a valuable prize!", the worst that Stone establishes is that the users of the computer-generated mailing lists live by the rather cynical dictum that it is morally wrong to let a sucker keep his money.

In defense of the mailbox polluters, it should be noted that while filling the wastebaskets of America is not a profession that we should encourage our children to pursue, it is hardly as great a threat to society as such brazenly criminal acts as littering and double-parking.

Steven K. Johnson
Alexandria, Va.

THE DATA CENTER/John P. Murray‡

Information Centers Demand MIS Attention

A great deal is being written about the use of the information center concept within organizations. While most of that which has been written has been favorable, and while there is considerable interest in the subject within management information systems (MIS) departments, movement to interactive processing under the heading of the information center has not been particularly rapid in many organizations. In some instances, once introduced, the effort has been less than successful.

The fact that what might be characterized as unnecessary delays and difficulties are being encountered is unfortunate. The benefits to be derived from the information center are so positive for most organizations that the effort should be aggressively promoted by MIS management.

Having had an information center in operation for the past 15 months and having experienced rather good success with our venture, I would like to pass along some general comments that I hope will encourage others to move to an information center approach.

Several Important Criteria

There are several criteria that are very important in the design and development of the information center. The effort can only be successful if these items are accorded appropriate time and attention by MIS management. However, prior to considering specific points, it is absolutely necessary that the MIS manager be willing to make the required commitment to the information center and that he be willing to support the effort actively.

'The benefits to be derived from the information center are so positive for most organizations that the effort should be aggressively promoted by MIS management.'

Unless MIS support is complete and unless MIS is willing to take an aggressive position in order to push the information center, little will be accomplished. What will occur, probably, is that the more aggressive MIS clients, those who would make the information center a success, will simply install small processors of their own. Is that good or bad? It depends upon the particular organization, but it is unfortunate that the MIS clients will have had one less option to consider.

What should the MIS manager be focusing on to get the information center effort moving? There are three items: planning, careful and controlled implemantation and salesmanship. In fact, when you think about it, these items are nothing new; they should be mandatory for all MIS work.

Planning is the primary issue. What must be avoided is the tendency to wade into the project and then attempt to handle the problems as they arise.

The MIS manager must be aware of the need to develop and maintain a high degree of credibility in building an effective information center. Questions with respect to what services and programming languages will be offered, what the costs to the clients will be, what level of MIS support will be provided and the specific responsibilities of both MIS and those outside MIS who will use the information center must be addressed and answered.

The implementation of the information center service should be carefully managed. The MIS manager should be certain the first people to be selected are good candidates. These first clients should be willing to learn how to operate in an interactive mode and they should be ready (if not eager) to begin. The management of the department where the first projects are to be implemented must also support the effort. The degree of sophistication of these clients is much less important than their willingness to learn.

The selection of the first projects should be done with some care. These first efforts should be small, and the work to bring them on-line should be as easy as possible, yet the final result must be meaningful to the department involved. The goal should be to begin with several very clear examples of success. Once some experience has been gained, more ambitious projects with improved payback can be addressed, but at the beginning it is important to avoid negative situations where possible.

Selling the Center

The selling of the information center may be the most important aspect of the process. If the planning and implementation are correctly handled, much of this selling will be done by those who are using the system and obtaining benefits from it.

The management of MIS should take an active role in announcing the system and, when possible, making formal presentation about the advantages of the information center and about the successes of the process. Whenever MIS has something good going for it, it should tell people.

Where the information center is correctly installed and managed, the results will prove to be very positive and will begin to become apparent in a very short period of time. But the effort requires time and energy.

Murray is director of management information services for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 20 years of DP experience, 10 of which have been devoted to the management of data centers.

READER COMMENTARY/N. Chapman and J. Tricebock‡

Real Users Always Must Get a Cup of Coffee

Last, but not least, we come to those individuals who make the jobs of corporate data processing employees possible — the users. Users are such a diverse group that it is a challenge to describe the real article. However, they share certain definable characteristics.

Time was when the Real User simply accepted what DP was going to give him anyway. He might never use it, but he felt too intimidated to explain what he wanted.

Those days are gone forever. Now the Real User has been educated to understand what DP is doing. Confronted by structured walk-throughs, data flow diagrams, sign-off forms, time-sharing, service requests in tripilicate, enforced cut-off times and systems analysts who write memos, the Real User must maintain his mental health and avoid outrageous charge-backs.

Hallmark of Real User

The hallmark of the Real User is the ability to perform successfully his real job function, while at the same time making sure that the DP systems essential to his department run smoothly and efficiently. This demands a superb juggling act and, sometimes, a lot of patience.

We offer these guidelines to help Real Users cope. If the response is sufficient, we will schedule a walk-through for clarification:

- Real Users always read the user's manual.
- Real Users dress for success.
- Real Users complete their input documents legibly.
- Real Users always have to get a cup of coffee.
- Real Users write long memos.
- Real Users apply DP terminology to non-DP situations.
- Real Users are nice to their programmers.
- Real Users review all documents before a walk-through so they will know what's wrong with the system.
- Real Users always leave the analyst smiling.
- Real Users do not call the operations department when the system is down.
- Real Users know that more than one function occurs in the computer room.
- Real Users do not refer to the data entry section as "keypunch."
- Real Users think the "S-Pool" is an urban planning term.
- Real Users like microfiche.
- Real Users understand the use of

(Continued on Page 55)

READER COMMENTARY/Jean Tricebock‡

Real Operators Are Good Softball Players

In the past, the life of a computer operator was simple. During his working hours (usually strange), he could interact with his mainframe on a one-to-one basis, performing a myriad of functions from punching and sorting cards to report-balancing and delivery. As long as the work was processed correctly, no one questioned the methods.

Times have changed. Today's operator must learn to deal successfully with scheduling queues, warm boots, knowledgeable users, time-sharing, the auxiliary console, as well as *other* three-day work week employees.

The following list should help the Real Operator understand what's expected of him in this ever-changing environment. (Don't panic, it's not another procedure!):

- Real Operators trust everyone, especially job set-up.
- Real Operators have studied user interpretation.
- Real Operators handle tapes properly and never mount the wrong reel.
- Real Operators are good softball players.
- Real Operators don't give time estimates.
- Real Operators never say, "It's a hardware problem."
- Real Operators are nice to their field engineers.
- Real Operators dress for success on Saturdays.
- Real Operators think a structured walk-through is a tour of the computer room.
- Real Operators enjoy giving computer room tours.
- Real Operators read hardware manuals during system downtime.
- Real Operators do not understand the five-day work week.
- Real Operators know what CPU stands for.
- Real Operators do not try to impress users with hardware acronyms.
- Real Operators have memorized processing times for all production activities.
- Real Operators do not count the number of jobs that abort.
- Real Operators remain calm, even when everyone else isn't.
- Real Operators don't play video games — they build them.
- Real Operators bring extra clothes to work when it snows.
- Real Operators don't go to the Bratwursthaus after work during closings.

Chapman is a data control supervisor.

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HUMAN CONNECTION/Jack Stone

DP Experience: Hire or Nurture From Within?

There is a great deal of allure to our business, but it has many irritating aspects as well. One of the most aggravating to DPers is the almost universal policy of hiring experienced professionals from the outside to fill senior positions, thus closing our opportunities for growth.

In spite of the business "justifications," everyone knows that this practice not only antagonizes the on-board employees, but is the major reason for the rampant, insidious job-hopping that has plagued the industry for years.

This is a hot issue, one of many DP management practices that are grossly unfair to DPers and that I'd like to pursue in future columns.

If you have been trod upon because of outside hiring by your organization or some other misbegotten practice and if you have some decent thoughts about it, then let me hear from you (via letter directly to me at Suite 207, 1377 K St. N.W., Washington, D.C. 20005). Maybe if we work together and give these matters enough publicity, we can help stamp them out. Naturally, if you request it, I'll keep your name and affiliation out of the paper.

William A. Delaney, president of Analysis and Computer Systems, Inc., a software firm in Bedford, Mass., has sent another thoughtful letter to me as he has over the years. In this column, the first of two on his letter, he takes a manager's viewpoint; in next week's, he takes the programmer's position:

"I read with interest your recent article [CW, Oct. 25] concerning the hiring vs. in-house training of programmers. The problem of training in-house junior personnel or hiring the experience you need is an old one and there are no easy answers. I've lived and worked on both sides of this issue for many years.

State Problem Clearly

"It sometimes helps to try to state the problem clearly in objective terms rather than emotional ones."

"First, let me paraphrase what managers of companies like mine say: 'I hire 10 new graduates. I spend about a year training them, at a cost in salaries of about $250,000. Add to this the indirect costs of the time and effort of my senior staff to train them. Seven or eight of them now resign to go elsewhere for a big raise, having gained "experience" at my expense.

'Most talented senior people do not like to spend time training others. The "teachers" don't learn anything, and it's not very interesting work for them, either.

'There are jobs to be done now and paying clients waiting for service. I can't spare my best programmers to teach others, and if I don't put my best people on the training job, I'll get poor results from the effort.

'I must hire the talent I need when I need it, pay the going rate and pass on the costs to the client. If it's a government job, the higher the costs, the higher (not lower) the profit. It's backwards from the way it should be, but that's the way it is.

'In brief, I need productive people now, and I can't afford to wait around for the nine to 12 months it takes to make current staff productive.' "

The Hallmark Of a Real User

(Continued from Page 51)

the telephone network perfectly.

- Real Users know the difference between word processing and data processing.
- Real Users also know the difference between the operator, the analyst, the programmer, the group leader, the production support specialist and job setup.
- Real Users always meet their cut off times.
- Real Users are as adept with their professional jargon as data processing professionals are with theirs.
- Real Users never use the term "data processing professional."
- Real Users do not unplug their phones at night during closing week.
- Real Users are not intimidated by technical considerations.
- Real Users want to know what happened, but first they want you to fix it.

Chapman is a data control supervisor; Tricebock is a systems analyst.

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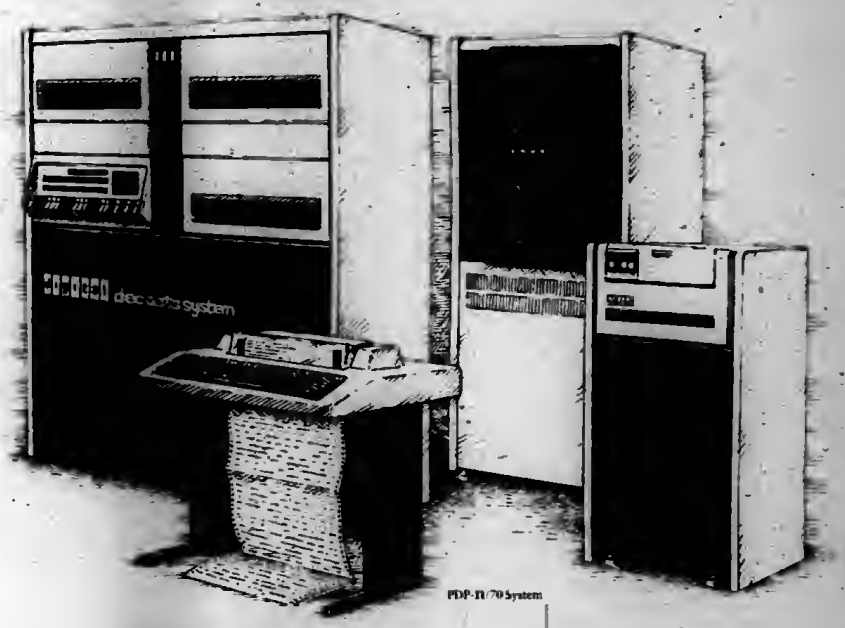

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GETTING AHEAD IN DP/Donald J. Berardo

An Opportunity for Promotion, But . . .

You have worked hard over the past five years to reach your current position in data processing. You are a senior analyst/project leader with a good track record; you now earn $21,000 per year and supervise three junior analysts/programmers. You have always wanted to reach the internal DP consultant level, particularly in a large user area.

Such an opportunity finally presents itself; but you also hear that your new boss has a reputation for being unpredictable, severe, excessively demanding and difficult to work for in general. If you refuse this promotion, your chances for future promotions may diminish — word travels fast in any DP area. If you accept the promotion, your daily stress, for at least a year, may increase dramatically.

This is a balance sheet problem. First, to gain objectivity, separate your emotional reactions from your analysis. Later, you have to add your "gut feelings" about this promotion to your objective calculations.

Balance Sheet

Set up your balance sheet as follows:

1. Your dollar income — will it increase now (in your present position) or then (with the promotion)?

2. Your potential — will your present job enhance your promotability or should you transfer?

3. Your power — will you have more by staying or going?

To help answer these questions, ask yourself: Why is the job open? Did your predecessor move up or out? Promotion or attrition? Compare your dollar income answers to your total financial situation and plans. Finally, will your decision to stay or transfer affect your marketability inside of the company in the long run (two to five years)?

Now you can address your emotional reactions to the new boss's reputation. Write down your worst fears about your possible new boss. Look them over carefully. Have you heard that he's verbally abusive? That he skimps on promotions and raises? That he works his people harder than he works himself? That 15 people have left the department in a year because of him? But consider the source of your information — does it come from only one person? From people inside the department or outside it? Sift the facts from the rumors.

Negotiate About Your Worries

If you have sound, factual evidence that this boss is erratic, decide how much stress this could cause you and whether you can lessen this stress in some way. For instance, can you talk directly to this boss about your worries and negotiate with him?

If he likes to speak his mind, get his guarantee that he criticize you only in private, not in front of fellow employees. If he demands unusual amounts of work, get him to specify his requirements about project deadlines and meetings per week. Ask him what he expects of you and insist on clarifying the objectives for your first year. Written contracts about such concerns greatly help to limit the guesswork and future "I told you so's."

The last appraisal you must make is: How will accepting or refusing the promotion affect your self-image and your potential image at work? Will you be kicking yourself in a year if you turn the job down? Will you damage your future chances for promotion by refusing? If so, how seriously? Which will make you look smarter — acceptance or refusal?

If the emotional price of the promotion is higher than the financial and professional gain, staying where you are could be your best choice.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

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LETTERS

Automatic Programmers

Real Programmers, unlike the pedants of the business world, do not need or use checklists to cope with all the assaults of modern programming, such as group leaders and walk-throughs, as mentioned in Jean Tricebock's reader commentary "'Real Programmers' Don't Eat From Vending Machines" [CW, Nov. 1].

They get results in a manner much the same as the machines they program do: They perform consistently and they do it automatically.

Dick Markusen
Programmer Trainee
Gettys Motion Control Division
Gould, Inc.
Racine, Wis.

DISK TECHNOLOGY

Major League™ Baseball Courtesy Mattel Electronics

A WHOLE NEW BALLGAME

By Mike Jennings

The storage problem boils down to this: All computer user communities need peripheral memory that includes at least Winchester technology, faster access times and transfer rates, greater capacities and more and cheaper storage per square foot of available space.

To understand this problem better, consider capacity, fast access, technology and physical space in greater detail. Capacity, for example, is closely linked to today's increasing volume of computerized data. Two factors are primarily responsible, both of them related to data base management:

- The use of integrated and relational data base management systems (DBMS) on one hand and distributive systems employing data base tools on the other.
- User maturity toward data processing and data base techniques.

The pricing history of disk drives has encouraged the trend toward dependence on this type of storage. While capacity is increasing, cost per megabyte is decreasing — certainly a healthy trend (see Table 1 and Figure 1 on In Depth/3). Note, though, that despite the decrease in cost per megabyte, the increasing dependence on disk results in an increasing disk share of system cost relative to the CPU.

In addition to the increase in data volumes that disk must handle, improved software is also demanding more peripheral memory. Again, the evolution of DBMS accounts for a large portion of this need; data base software is finally becoming dependable and easier to use, thus increasing the use of such systems.

Two other software advancements also apply here. First, a demand for high-level software to furnish user-friendly system communications is consuming more peripheral storage capacity. Second, the popularity of multifunction systems has created a

IN DEPTH

requirement for more software and thus more storage.

Another aspect of the current disk drive problem is the access time limitation. With today's trend toward use of decision support systems and on-line graphics for management, ever greater volumes of information must be available on demand. Of course, hierarchical storage concepts are still an important part of planning for such systems. While moderately critical data can be stored on a rather slow disk and archival data can be dumped to tape or even stored optically, data that is subject to immediate access must reside on the fastest drive possible for best system utilization.

'As an alternative to the discrete magnetic particles in oxide disks, thin-film disks provide a recording surface of continuous metal or metal alloy. This film, in a very thin layer, can sustain 20,000 bit/in., compared with about 6,500 bit/in. for the typical oxide disk.'

Access time has always been a sore point in computer systems. Because of technology limitations, CPUs have traditionally had faster channels than their respective disk storage devices. Fortunately, developments for faster disk subsystems are helping correct this technological mismatch.

The final aspect of the current storage problem is that floor space is at a premium in large companies and major metropolitan areas. A high-capacity, high-throughput disk drive will do no good if the user has no place to put it.

The Disk Solution

Disk drive manufacturers are faced with the task of furnishing increasing amounts of disk capacity that can be accessed at increasingly higher speeds, fit in vanishingly small spaces and cost less per megabyte than ever before. These goals can be met in several ways, but the key to increased storage capacity and the resulting decrease in the cost of disk files lies in the recording head and recording media technologies. Until the advent of the IBM 3370, almost all disk files used particulate disks and ferrite heads.

It has been common knowledge for years that a surface's recording density can be increased dramatically by thin-film heads and disks used separately or together. With the announcement of its 3380 series disk files, IBM chose to boost recording density — and claims the industry record for this parameter — by introducing thin-film heads, but retaining particulate disk media. On the other hand, engineers at Ibis Systems, Inc. argue that even better performance can be attained by using the conventional ferrite head with a thin-film disk medium.

A further increase in linear recording density is possible with a technique called vertical recording. This approach contrasts with conventional recording, in which the direction of the disk magnetization lies in the plane of the medium; rotating the magnetization direction in the same plane results in a magnetic transition detected by the recording head as an electrical signal — a binary 1 or 0.

Vertical recording makes use of a magnetic recording film that is vacuum-deposited so that magnetization can take place only perpendicular to the plane of the film. Higher bit densities thus become possible. In fact, densities as high as 100,000 bit/in. have been reported by S. Iwasaki of Tohoku University (Sendai, Japan) and Prof. J. Judy of the University of Minnesota (see sidebar on In Depth/5).

To see how these developments are helping solve today's storage problem, consider the technology behind each of them in more detail.

Magnetic Recording

Magnetic recording is a matter of introducing magnetic transitions on

DISK PRICING HISTORY

Year Announced	Device	Capacity (M bytes)	$/Mo/M byte
1956	IBM 350	5.0	153.00
1964	IBM 2311	7.3	75.00
1965	IBM 3214	29.1	23.00
1970	IBM 3330-1	100.0	8.30
1973	IBM 3330-11	200.0	4.85
1973	IBM 3340	70.0	7.50
1975	IBM 3350	317.0	2.25
1978	STC 8650	635.0	1.50
1979	IBM 3370	571.0	1.65
1980	IBM 3375	820.0	1.26
1980	IBM 3380	1,260.0	.84

Table 1

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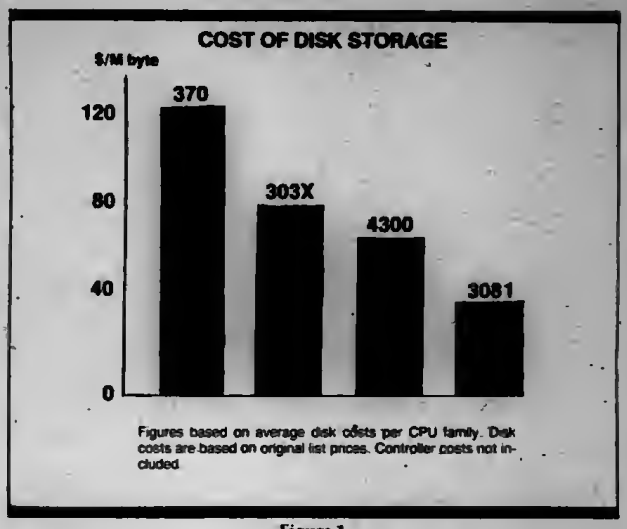

Figure 1

a hard magnetic material. A magnetic transition is a zone in which the usual direction of magnetization is reversed to the opposite direction, and a hard magnetic material is one that can be influenced by an external magnetic field to acquire a strong magnetization, which remains after the external field is removed.

The process of passing an electric current through a coil in the head magnetizes the material, and the current's direction determines the direction of the field produced by the head. This field in turn establishes the direction of magnetization on the recording medium. Alternating the direction of the current in the head coil introduces magnetic transitions in the recording medium that signify, by their presence or absence, binary 1s and 0s, depending on the encoding scheme employed. A given medium's recording density can be expressed in terms of the number of magnetic transitions per linear inch and the number of data tracks per inch — referred to as bit/in. and track/in., respectively.

The head reads data by taking advantage of the movement of the recording medium. The magnetic field variations caused by the transitions on the recording medium produce a change of magnetic flux at the head, which results in an induced voltage in the sense coil.

In operation, the head does not come into contact with the disk. Rather, the head's aerodynamic air-bearing design causes it to fly above the disk surface because of the air dragged by the surface's fast circular motion. The usual flying altitude is about 40 microinches or less. Low altitudes allow the head to resolve the magnetic fields on the disk better and thus permit a higher recording density.

The Oxide Disk

Recording density depends on several head and recording medium characteristics. The traditional disk medium, known as the oxide disk, is made by dispersing hard-magnetic iron oxide particles in an organic binder, which is then coated on a circular aluminum substrate.

Applying the oxide medium in a thick coating causes a number of problems. For one thing, it limits the number of bits that can be recorded per inch. And it produces a high-level of interaction between the magnetic fields of adjacent transitions.

The latter problem also causes distortions in the magnetic fields detected by the head, so that a transition's apparent position differs slightly from its true location. This phenomenon, known as bit shift, worsens with increasing bits per inch and results in a shift in signal detection timing, which is a major source of data errors. In addition, the discrete oxide particles in the recording medium produce a large number of spurious magnetic transitions that manifest as disk noise in the detected signal.

Thin-Film Disks

As an alternative to the discrete magnetic particles in oxide disks, thin-film disks provide a recording surface of continuous metal or metal alloy, such as pure cobalt or cobalt/nickel/phosphorous alloys. This recording film deposited in a very thin layer can sustain 20,000 bit/in., compared with about 6,500 bit/in. for the typical oxide disk. This comparison assumes that the same type of conventional ferrite head serves for the read/write process on both disks.

Another advantage of the thin-film disk is less disk noise because of the continuous nature of the recording film. The signal-to-noise ratio improves by a factor of three, which permits more accurate servo operation and thus a 30% increase in the number of tracks per inch.

Some of the steps used to produce thin-film disks, such as micro-finishing the disk surface and depositing a protective coating on the disk, also furnish benefits. The micro-finish process allows the deposition of a thinner magnetic film with fewer defects. And thinner film results in a disk with increased bit packing density. The micro finish also lets the head fly at a lower altitude than is possible with the oxide disk, which again increases the bit packing density. As for the protective disk coating, it dramatically improves the surface's resistance to mechanical head/disk interferences, compared with oxide disks.

Thin-Film Heads

Like recording media, the different types of read/write heads can greatly affect a disk drive's performance. Conventional ferrite heads can be modified to fly at very low altitudes and can be tailored to track widths as narrow as 0.0006 in., corresponding to 1,200 track/in., but these heads' resolution (the ability to read closely spaced transitions on the disk) is limited by the minimum dimensions that conventional mechan-

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IN DEPTH

Head Type	Conventional Disk	Thin-Film Disk
Conventional	960 track/in. 6,600 bit/in. 6.3M bit/in.²	1,200 track/in. 20,000 bit/in. 24M bit/in.²
Thin film	800 track/in. 15,000 bit/in. 12M bit/in.²	1,200 track/in. 30,000 bit/in. 36M bit/in.²*

*An additional increase in bit/in. with high-resolution heads is possible by using expansion codes (also known as RLL or run length limited codes), which provide more than one bit of data for each magnetic transition on the disk.

Table 2

ical machining operations can produce.

Thin-film heads, however, are manufactured using thin-film deposition and photolithographic pattern-definition methods similar to those used in semiconductor manufacturing. The high resolutions of heads produced by these processes result in recording densities that exceed those possible with ferrite heads by 50% on both oxide and thin-film disks. Thin-film heads thus make it possible to record 10,000 bit/in. on an oxide disk and 30,000 bit/in. on a thin-film disk.

As mentioned previously, thin-film disks also provide the ability to record at 1,200 track/in. instead of the signal-to-noise-limited 800 track/in. figure of oxide-disk/thin-film-head combinations.

A simple calculation provides the maximum recording densities per square inch (bit/in. multiplied by track/in.) achievable with the various combinations of conventional and thin-film heads and disks (see Table 2). An additional increase in bit/in. with high-resolution heads is possible by using expansion codes, or run length limited (RLL) codes, which provide more than one data bit for each magnetic transition on the disk.

By paying attention to the efficient use of space when designing servos, air systems and other drive components, engineers can put the same amount of hardware in a significantly smaller box. Using large-scale integration (LSI) chips in a drive's electronic sections also helps reduce space requirements. And by employing a cabinet that is specifically fitted to a particular drive — rather than putting varying amounts of hardware in the same cabinet to make different products — designers ensure that each drive will occupy no more floor space than is really needed. In today's cramped data processing facilities, this consideration is critical to increasing the number of megabytes per square foot.

The Manufacturers

Several manufacturers are applying aspects of the technology discussed in this article, including Control Data Corp., Memorex Corp., Storage Technology Corp. (STC), IBM and Ibis Systems, Inc. The following review of their products and market positions gives a fairly comprehensive view of the major forces in the disk drive market.

Control Data Corp. has long been regarded as the dominant manufacturer of OEM disk drives, and the degree of that dominance is increasing. In 1980, the firm collected 55.1% of worldwide revenues for OEM rigid disk drives, with increases in all currently significant categories: disk cartridges, storage module drives (SMD), cartridge module drives (CMD), large disk-pack drives and mid- and large-capacity fixed disk drives.

Drives sold by CDC are designed and manufactured by Magnetic Peripherals, Inc. (MPI), a joint venture of CDC and Honeywell, Inc. CDC manages MPI and has exclusive responsibility for sales of its products in the OEM and plug-compatible manufacturer (PCM) markets. Annual production of drives for both parents is also growing, with increasing markets for large fixed disk drives.

(Continued on In Depth/6)

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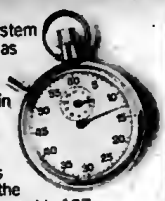

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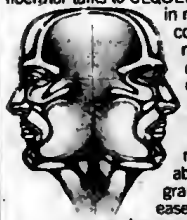

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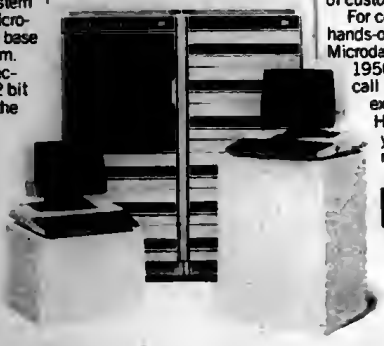

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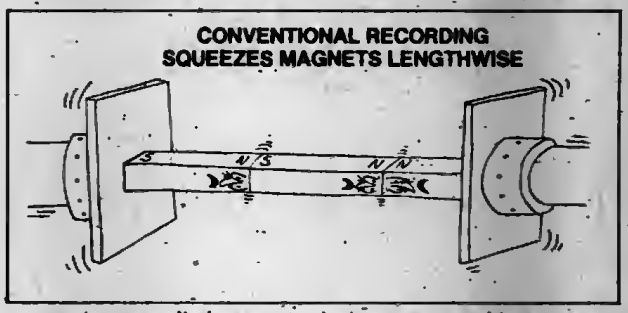
The Look of Storage to Come

Desktop and personal computers have arrived in most corporations, and the demand for computer storage is accelerating at a break-neck pace. A new technology for computer memories, perpendicular magnetic recording, promises to alter the market shares of participants in the $12 billion magnetic disk, drum and tape data storage market.



The new technology also offers considerable potential for digital audio and video applications and mounts a serious challenge to the much-vaunted laser recording field. Here's why:

• **Technology.** Perpendicular recording solves the inherent demagnetizing effect that creates memory errors, and which worsens as recording density is increased. Even in its infancy, the new memory technology promises a density of 100,000 bit/in., a 10-fold improvement over conventional "longitudinal" recording, which has taken 25 years to attain 10,000 bit/in. Moreover, there are reports from Japan of experiments that provide evidence of perpendicular recording at 440,000 bit/in.

The key to the new method lies in a shift from horizontal to vertical recording (see accompanying diagrams). In horizontal recording, data is stored by magnetizing slivers of iron oxide so that they resemble bar magnets lying end to end. The position of each magnet's north pole indicates either a 1 or a 0 in binary computer language. As more data is squeezed onto the medium, the magnets become shorter and weaker and require more sensitive electronics to detect their poles' positions.

In contrast, vertical recording stands the magnets at right angles to the recording service in a crystal structure made from cobalt and chrome. This allows packing the magnets more tightly without decreasing their strength.

The new technology also threatens laser methods. Laser recording is limited by diffraction to about 25,000 bit/in. Moreover, laser recording is a "read-only" process, while both vertical and horizontal methods provide both read and write capabilities.

• **Hardware, Applications.** The first memory products to exploit perpendicular recording's high data density will be floppy disk memories, which are widely used in small business systems and home computers. Prototypes have been demonstrated, and commercial hardware will come on the market by next year. Early hardware will offer three to five times the storage capacity of existing floppy disk memories at roughly 30% to 75% higher cost. Later designs will push down the cost per bit even further. In due course, digital recording of music and video information will take advantage of perpendicular recording's remarkable memory capacity.

Following the initial market success of floppy disk memory devices using perpendicular technology, a number of manufacturers are likely to launch hard disk data storage that challenges present Winchester systems. Since the Winchester disk is sealed in a clear-air environment, it lends itself to the meticulous mechanical engineering necessary to increase the number of tracks per inch, and also to the control of the flying height of the head relative to the magnetic recording surface.

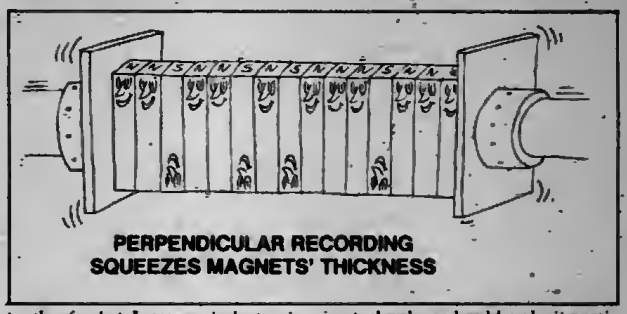
The potent combination of more tracks and perpendicular recording's initial 10-fold increase in bits-per-track will give designers the headroom to continue product evolution through the rest of this century. To date, 5¼-in. Winchesters can accommodate upwards of 10M bytes per disk. Since memory designers have doubled capacity every two to three years for the past 25 years, perpendicular recording provides the technological advance that can be expected to maintain this progress for many years to come.

• **Markets, Competition.** The market for disk, drum and tape memory systems is about $12 billion and grows by 15% annually. Sections of the market, like floppy disk and small Winchester hard disk devices, are growing much faster. Coincidentally, this market is approximately the same size as the worldwide semiconductor market.

Since market shares in a fast growing field of technology can be strongly affected by scientific breakthroughs, the advent of perpendicular magnetic recording can be expected to have a major impact upon present memory equipment manufacturers — including established vendors like IBM, Storage Technology Corp. and Control Data Corp. To a considerable extent, the new technology is being advanced by an alliance of Japanese industry and universities.

Top Contenders

In America, only the University of Minnesota operates at the forefront of this new science, while corporate investment in pure and applied research amounts to less than one-tenth of what Japanese industry is investing.



IBM has been doing research in vertical recording for more than 20 years, but has yet to bring that technology to market. It will be under increasing pressure to do so as Japanese electronics companies, including Hitachi, Fujitsu, Sony and Toshiba, gear up for a major assault on that market.

Several small U.S. companies, such as Ibis Systems, Inc., Xidex Corp. and Vertimag Systems Corp., are also eyeing the vertical recording market. To date, however, Japan's Anelva Corp. is the only company to produce vertical recording media. The process of creating the vertical crystal structure is still slow and costly, and Anelva is providing the media only in limited volumes.

Vertimag hopes to begin selling in 1983 a complete vertical recording system. The system will store 10 million characters on a 5¼-in. floppy disk and sell for about $750, or $500 in large-quantity orders. Comparable storage capacity on a modern Winchester drive with an 8-in. disk is currently selling for $1,200.

By the mid-1980s, vertical recording technology should make it possible to cram 50 to 100 times more data in the same amount of space, while existing recording methods are expected to do no better than a fourfold capacity increase. And, since the new technology is expected to cost only twice as much as current storage techniques, analysts predict that vertical recording should dominate the computer storage market by 1990.

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(Continued from In Depth/4)

CDC is active in the PCM market for large fixed disk drives, too, and held 20.1% of worldwide PCM revenues in 1980. It is expected, though, that OEM drives will continue to be CDC's most important product area and that the firm will retain its leadership in the high-performance rigid disk drive segment.

New CDC product introductions for several types of OEM drives have been made. These new drives, including an IBM 3380 class, the CDC 33800, may serve as the basis for the firm's continued competitiveness in high-performance rigid disk drives.

'Storage Technology Corp. continues to be a successful survivor of the high-risk environment in IBM's shadow, first with IBM-compatible tape drives, then with 3350-equivalent disk drives.'

Memorex Corp. has continued to report problems. In mid-1981, Burroughs Corp. outbid a previous offer for Memorex from STC, and early this year Memorex's acquisition by Burroughs was completed.

According to published reports, poor manufacturing yields for 3350-equivalent drives have limited Memorex's ability to take advantage of a strong demand for these products. OEM sales for Memorex are expected to decline since most of the company's disk drive revenues are from Digital Equipment Corp., and DEC has been buying large disk drives from Memorex competitors.

Recent announcements from Memorex include plans to de-emphasize some of the 8-in. Winchester drives developed for the OEM market in the past years. On the plus side, Memorex has introduced an IBM-compatible 3380 class, the Model 3680 drive, utilizing thin-film technology.

The third manufacturer to be discussed here, **Storage Technology Corp.**, continues to be a successful survivor of the high-risk environment in IBM's shadow, first with IBM-compatible tape drives, then with 3350-equivalent disk drives. The company will soon find it necessary, however, to completely replace these product lines with new ones compatible with IBM's latest generations of magnetic storage devices. And now the firm has embarked on a venture whose risks equal all those faced in the past: a plan to enter the high-end PCM mainframe business in 1984.

The short-term challenge in STC's disk drive product line is challenging enough for most, however. It involves a large-scale increase in existing product shipments just before the predictable decline of these products. The company is trying to double production of 3350-equivalent disk drives and shift a major portion of its product mix to double-density versions.

Parallel programs are under way to complete development and manufacture of 3370- and 3380-compatible drives (STC 8370 and 8380), which must result in hardware ready for production phase-in immediately behind the existing drive models. Plenty of opportunities exist in these activities for debilitating delays with major revenue losses, but STC has retained its early vigor and might just achieve its goals.

Oddly, though, STC has not duplicated its PCM market successes in OEM disk drives. The company saved up on its 14-in. family of intelligent OEM drives in late 1980 and withdrew from further marketing of the products. It is expected, however, that the firm will reenter the OEM area, either through acquisition or internal development. In the meantime, STC is beginning to receive OEM orders for large disk files similar to its standard PCM drives.

IBM. While IBM's competitors scramble to develop compatible recording technology — as introduced

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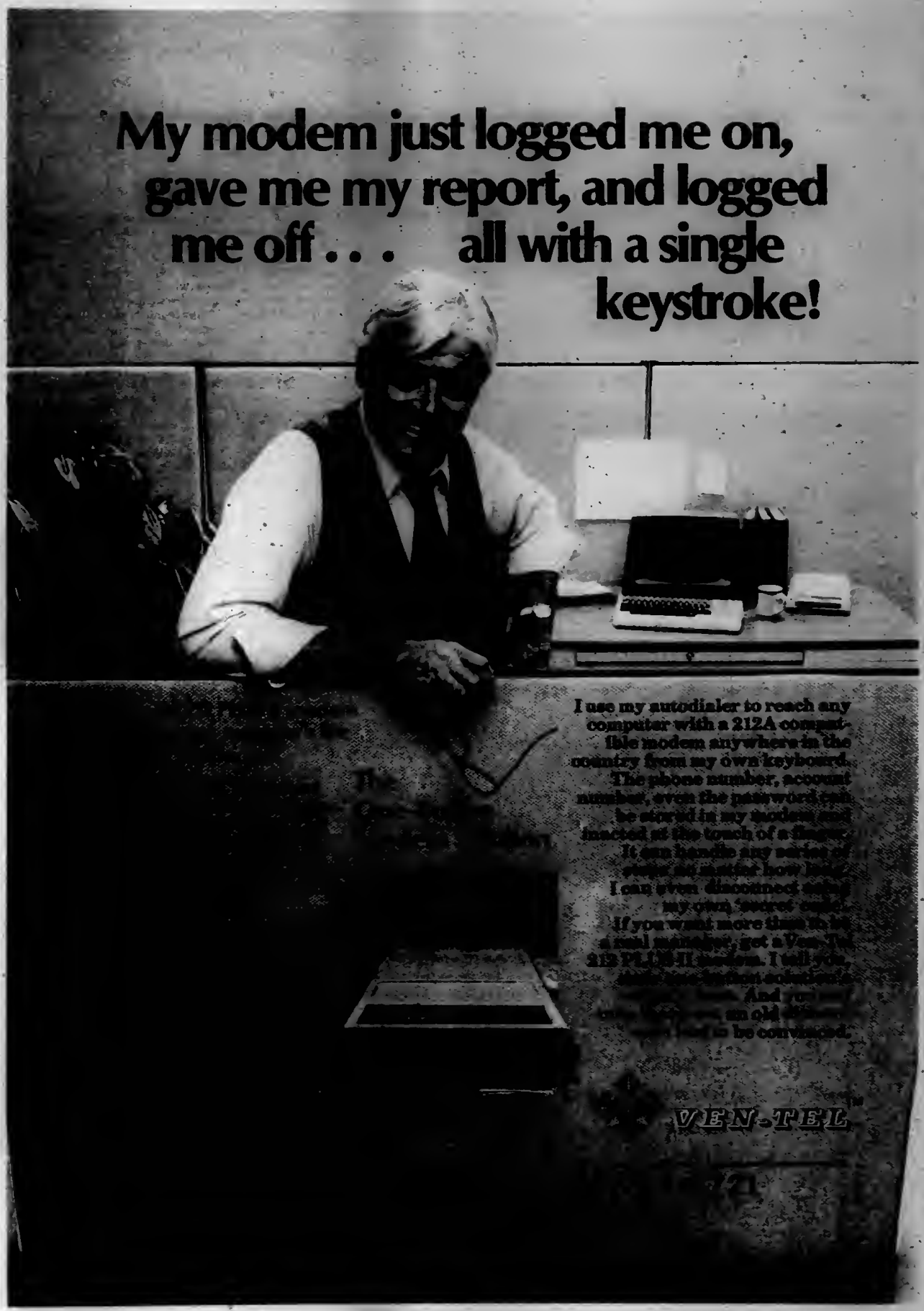

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IN DEPTH

in new-generation large disk files such as the 3370, 3375 and 3380 — IBM has had its own problems in getting the new drives into quantity production. Starting with the first 3370 shipment in October 1979, and continuing with very limited deliveries in the subsequent months, this start-up production was below expectations. The 3370 is now shipping, but in quantities far enough below demand levels to force IBM to severely limit deliveries to individual customers.

Shipments of the 3375, which is very similar to the 3370, are still below projections and the most important of all these new drives, the 3380, was delayed from the originally promised delivery in the first quarter of 1981. Current backlog is estimated at between 50,000 and 80,000 units, and the continuing delays in deliveries are resulting in a major realignment of competitive strategies among PCM drive manufacturers.

Independent manufacturers can thus realize another major growth year for 3350-equivalent drives — especially double-density versions — rather than trying to make the best of the shrunken market that would have resulted if IBM had met its original plan for the more cost-effective 3380.

Ibis Systems, Inc. designs, manufactures and markets a family of disk drives and controllers for both OEMs and end users. Drives for OEM customers have a storage capacity of either 1.26G or 2.52G bytes. The products offered to end users are 2.52G- and 5G-byte drives, Ibis 5380 models, with controllers — Ibis 5880s which thus constitute complete subsystems [CW, Nov. 15].

OEM products are SMD and IBM-compatible interface drives, while end-user drives are only IBM-plug compatible. The end-user products are physically similar to equivalent IBM versions, but they occupy about 20% less floor space.

All Ibis disk drives will be fixed-media devices that will transmit data at least at 3M byte/sec. They will use thin-film media and modified ferrite heads to achieve a high packing density — 15,294 bit/in.

Market Outlook

How do all these manufacturers shake out? IBM clearly leads the disk/controller segment with more than 30% of the market. IBM has opened the doors for competitive inroads, however, through its production difficulties in manufacturing the 3380 large disk system.

The consulting firm Applied Management Services suggests that "IBM's complete disarray of delivery dates [for the 3380] has created a scrambled frame of mind for many users. They are pressing to acquire any type of disk drives that will fill the gap caused by IBM's delays."

While all the problems have not yet been solved, the companies discussed here are on the threshold of making drives available that will help cope with the vast and growing demand for disk storage.

About the Author

Michael Jennings is director of marketing administration for Ibis Systems, Inc. in Duarte, Calif. He joined the firm in 1981.

Jennings has been in management, marketing and data processing for 22 years. His experience includes senior positions with Arthur D. Little, Inc., Caltech-Jet Propulsion Labs and the Oregon State System of Higher Education Data Center, as well as numerous consulting projects for governmental and commercial organizations.

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Generic Operating Systems:

Bringing the Pieces Together In Office Systems

By Paul Truax

Today's office information systems include a mind-boggling array of products that range from the simple intelligent typewriter and word processor to micros, minis and mainframes. Applications, even within a single office, range from daily clerical typing to a complex web of interlocking manual and electronic procedures.

To create an integrated, efficient information system, the question of compatibility among products must be addressed. Frequently, users have difficulty even distinguishing one class of products from another. The lines of separation are blurred or subjective at best. As the information processing industry explodes, the problems of incompatibility and integration of various systems has become a major concern for system implementers.

Users choosing an appropriate system frequently consider only applications and system cost. But as systems develop, their integration with each other is becoming increasingly important. Word processors must be compatible with photocomposers; microcomputers need to exchange information with minicomputers, mainframes and other microcomputers; many unlike systems will send messages to each other through electronic mail networks; computers, word processors and other information products may share common facilities, such as electronic filing, laser printing or communications processors.

Unfortunately, these connections are not that easily accomplished. There must be some significant efforts toward standardization. If the user were committed to only one

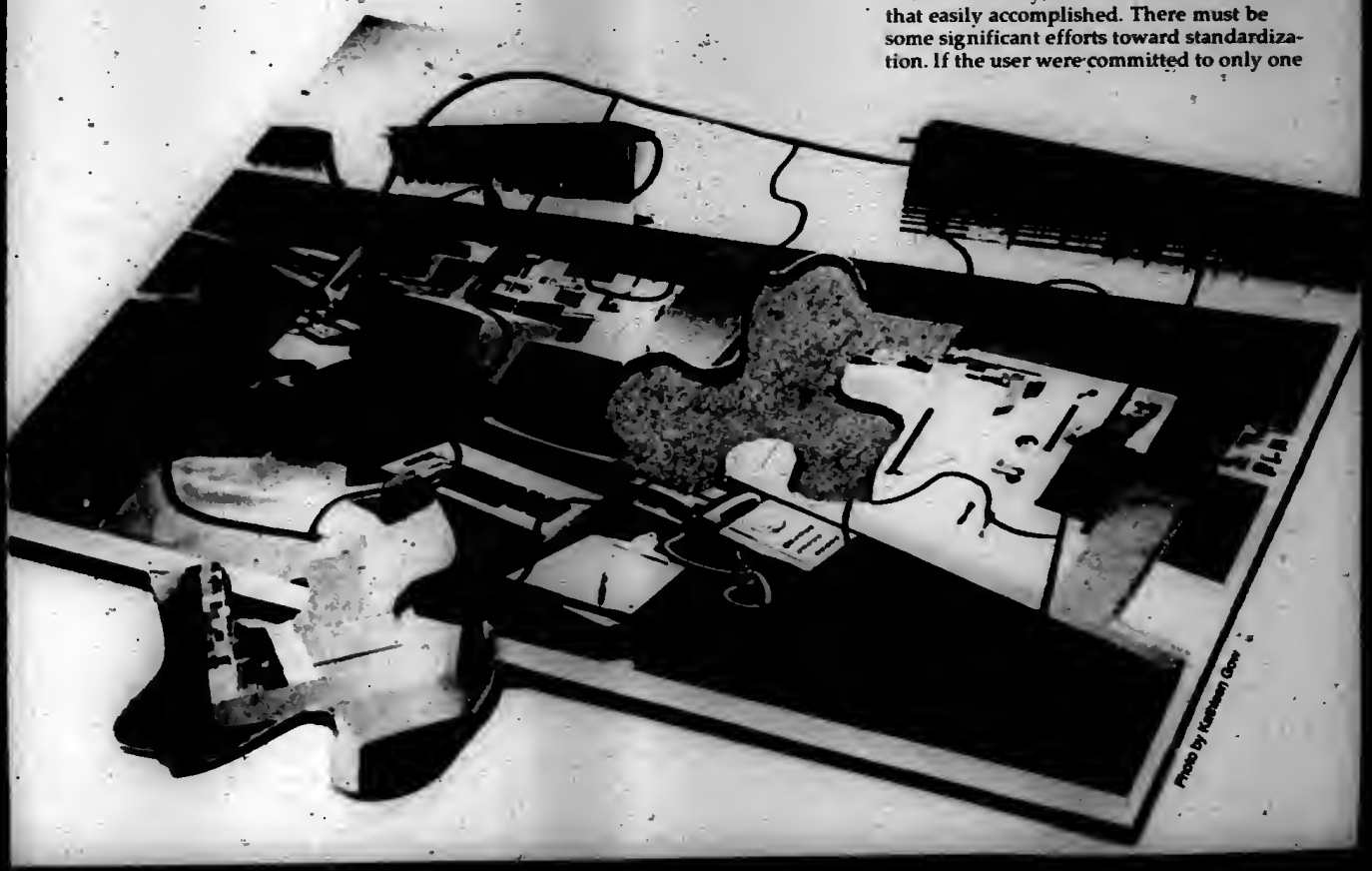
Photo by Kathleen Gow

IN DEPTH

manufacturer, many of the integration difficulties would be minimized. However, a commitment to one manufacturer is not practical if that means using a mainframe computer for all word processing applications as well as the data processing application for which it was designed. In the '80s, it is becoming increasingly obvious that a multitude of vendors will be supplying the needed systems.

To outline current needs, I divide the office information products marketplace into six product classes:

1. Electronic typewriters.
2. Family word processors.
3. Microcomputers.
4. Minicomputers.
5. Mainframe computers.
6. Peripheral information products.

This article will identify for the strategic planner those elements that will approach levels of ideal compatibility. First we will define each of the product classes:

• *Electronic typewriters.* Instead of being controlled by electromechanical parts, the electronic typewriter has programmed computer chips that determine every function. Some of the more advanced models can store typed input for later revision and output. These units may serve as a keyboard/printer for video display word processors, microcomputers or terminals on specific brands of these electronic typewriters.

• *Word processors.* These products are typewriters with CRT displays. Some may have data processing capabilities, but data processing is secondary to the primary application of typing.

We call these products "family" word processors, because generally, the manufacturer provides a series of products that range from single-station systems using diskettes to multistation systems using hard disks. These products are specialized small computers with their hardware design, operating system and application software geared primarily to the typing function.

• *Microcomputers.* The microcomputer is usually a general-purpose, 8- or 16-bit small computer. It often uses a single computer chip, a large-scale integrated (LSI) circuit. Some of these units are personal computers (for one user only), and others are multiuser. Historically, these units have used cassettes or diskettes for mass storage. In the last two years, hard disks have become available for some of the models, usually the multistation systems. The hard disks that have been implemented are usually factory sealed, called Winchester technology.

It is becoming increasingly difficult to distinguish these units from their big brothers, the minicomputers. However, the primary difference is in expansion capability. The large microcomputer is limited in its growth potential. It is usually limited in terms of number of terminals (three to eight) and maximum storage capacity. The small minicomputer may appear to be identical to the large microcomputer, but the small mini often can be ex-

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panded considerably with additional terminals, memory and mass storage. Some small minis can expand to mainframe proportions.

Microcomputers most often use an industry-standard operating system, which makes them reasonably compatible across brand lines. These operating systems include CP/M (Control Program for Microcomputers), developed by Digital Research, Inc., and Oasis, developed by Phase One Systems, Inc. Neither of these operating systems runs on minicomputers.

Word processing software is among the applications packages available for micros. Microcomputers used for word processing usually cost considerably less than the family word processors. However, the word processing software is considerably less "state of the art" than in the family word processing category. The microcomputer, however, because of pricing, is providing fierce competition to the word processing industry as well as the low end of the minicomputer marketplace.

• *Minicomputers.* The minicomputer is a general-purpose, medium- to large-scale computer system. Minis are generally 16- to 32-bit processors and usually range in size from three to 256 terminals. They have extremely flexible expansion capabilities. The operating system software is generally unique to that specific brand of hardware, but is also usually much easier to use than software available on a microcomputer.

Most of the minicomputer manufacturers have been slow to develop state-of-the-art word processing application software, especially software that is "user-friendly." Most of these manufacturers have chosen specific niches: the small business computer, the large general-purpose minicomputer, scientific computers and "front-end" distributed processing machines that go into large mainframe computer products.

Minicomputer manufacturers have developed the "supermini," a 32-bit processor that looks more like a mainframe than a minicomputer. Most have moved their emphasis to the high end of the minicomputer spectrum and have conscientiously moved away from the low-cost microcomputer competition.

The mini and mainframe differ primarily in size and in operating system sophistication. Some mainframes, for example, can run multiple operating systems concurrently, while most minicomputers can run only one. However, even that distinction is blurring.

• *Mainframe computers.* IBM dominates this segment of the marketplace with its 370 family and has entered the supermini class with its 4300 series, which maintains compatibility with the 370 products. The size differences between the 370 and some of the large superminis are only slight. The real differences lie in the 370's operating system.

Those mainframe products that have been successful have IBM-compatible operating systems. The tradi-

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IN DEPTH

tional mainframe competitors such as Honeywell, Inc. and Sperry Univac have lost market share to the IBM-compatible group. However, the mainframe vendors as a group have lost market share to both the micro and minicomputer classes. Data processing is getting more and more distributed (decentralized), incorporating more smaller computers.

The 370 operating systems are old and not necessarily easy to use (or efficient) compared with the operating system software for superminis. However, the 370 products will be with us for some time because of the large end-user investment in that software.

• *Peripheral information products.* This product class is a "catch-all" category for related information technologies including photocomposition, optical character recognition, laser printing and so on. These products are related to all of the other classes because they usually become part of other systems. Communications interfaces and networks make the difference in integrating the peripheral products.

Evolving Compatibility

Many manufacturers provide products in only one class and often have little or no interest in the various facets of integration with products from other manufacturers, either in the same class or others. Nevertheless, compatibility among these various products and product classes will be essential in the next five to 10 years. Users can expect more compatibility in the following areas:

1. The ability to communicate among different products and between different classes of products.
2. The ability to exchange data (information) among products and have that data become part of the receiving system.
3. The ability for units of one product class to become fully integrated terminals of products in other classes, not only acting on the other systems, but also receiving or sending information.
4. The ability to program a system of one product class and still exchange programs and have these programs operable on systems of different product classes.
5. The ability to have the same user-friendly interface, including all facets of training, with various products and product classes.

Obviously, these compatibility considerations go beyond communications to include training and the operator interface as well as programming requirements. No current series of products spans all of the product classes and can begin to meet all of these compatibility requirements. In the future, manufacturers should try to supply products in several classes by using compatible software and communications systems.

To understand these compatible software systems, we need to review the elements and definitions of an operating system.

Operating Systems

The operating system is a control or supervisory software system, "inherent" to the hardware, which manages all facets of the computer's use. It controls the tasks created by the computer's users.

The following summary of operating system functions has been adapted from Anthony Ralston and C.L. Meek's encyclopedia of computer science:

The operating system controls the creation and removal of tasks as well as their progress to ensure that no task will block the progress of another. The operating system also acts on exceptional conditions arising during the operation of a task — arithmetic or machine errors, interrupts, addressing snags and the attempted execution of illegal or privileged instructions.

The operating system allocates hardware resources among tasks and/or system users. It provides access to software resources such as file editors, compilers, assemblers, utilities, file-creation languages, procedure languages, language processors, communications utilities and so on.

The last function of the operating system is to provide protection, access control and security for stored information.

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GENERIC OPERATING SYSTEMS

IN DEPTH

Operating systems are often unique to a specific model or vendor; however, if two different brands or models use the same operating system, generally they would be compatible.

Software Tidal Wave

In the last five years, an important operating system phenomenon has developed, perhaps by accident. Specific operating systems have become "generic" and have even been considered standards within various product classes. These operating systems work with more than one vendor's systems and are frequently created by third parties, not by the manufacturer.

Being first often gives an operating system an edge in the marketplace as it claims a niche for a specific class of products. An operating system may also gain generic status because programmers find it easy to use, more efficient or more powerful than others. The system might be unusually versatile, addressing many environments and allowing the flexibility to move or share software among various manufacturers' computers.

These generic operating systems have grown by leaps and bounds in all product classes. Although an operating system usually starts in only one class, it may be extended to include several. The following shows the placement of the most popular of the generic operating systems:

- **CP/M-MP/M (Control Program for Microcomputers).** Developed by Digital Research, Inc. for microcomputers.
- **Oasis.** Developed by Phase One Systems, Inc. for microcomputers.
- **Pick.** Developed by Pick & Associates and Pick Computer Works, Inc. for word processors, microcomputers, minicomputers and mainframe computers.
- **Unix.** Developed by Bell Laboratories for word processors, microcomputers, minicomputers and mainframes.
- **IBM 370.** Developed by IBM for superminis and mainframes.

We see that some of the generic operating systems overlap in their placement. Because the operating systems vary in strengths and weaknesses, current and future applications should determine the optimum operating system.

Operating Systems Overview

CP/M and Oasis. CP/M and Oasis were primarily designed for 8-bit microcomputers. However, 16-bit versions have been introduced. CP/M is not as easy to use as Oasis, but has been around longer. Oasis is significantly better for multiterminal applications than is MP/M (the multiterminal version of CP/M). Oasis is a superior data base management system. Since CP/M is older, more "off-the-shelf" software is available for it.

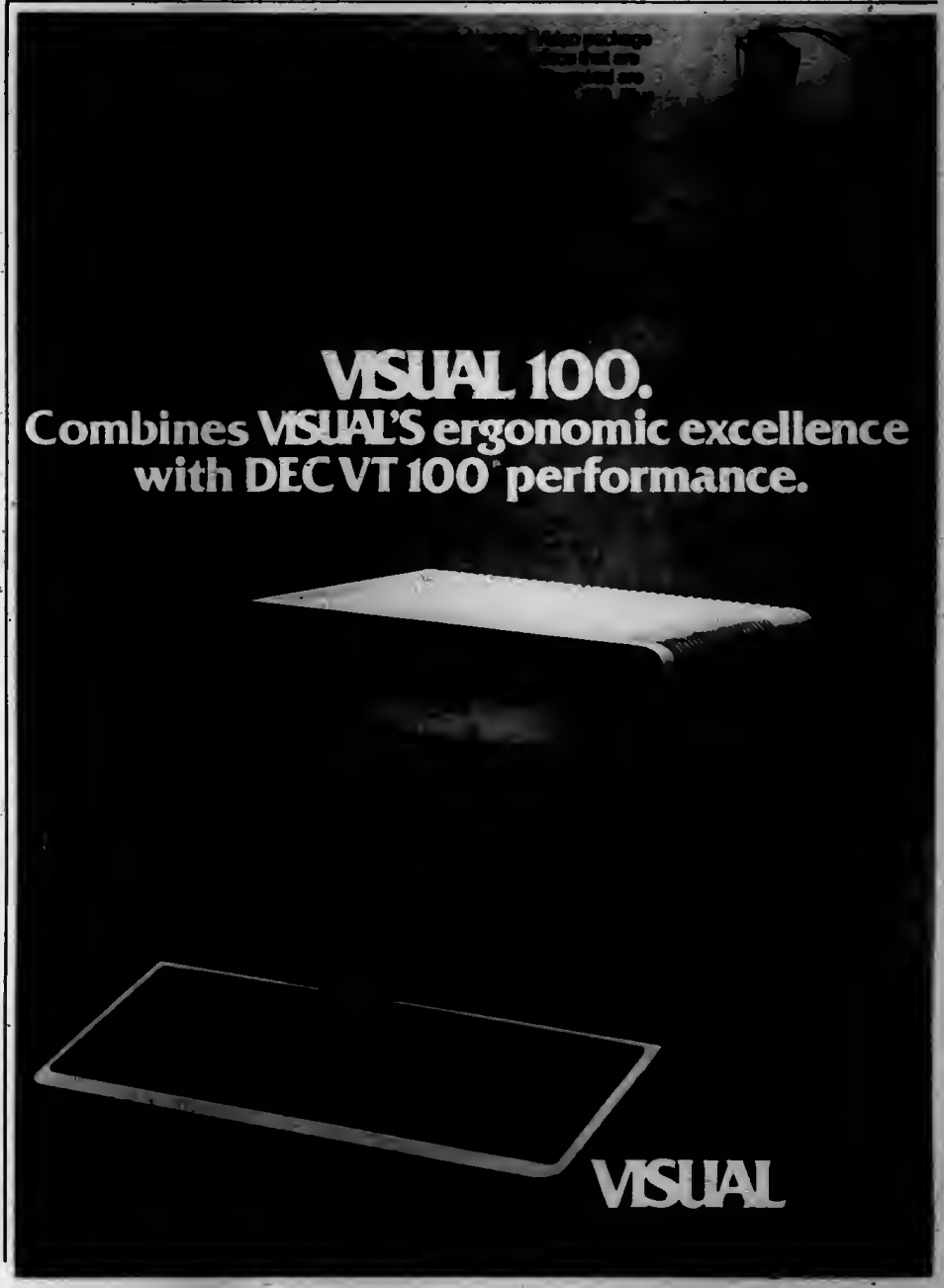
Oasis is a data base management operating system for a microcomputer. CP/M, MP/M and Oasis originated with the microcomputer, using 8-bit processors. As the microcomputer industry moves to 16-bit processors, both CP/M and Oasis have developed 16-bit versions, which are still unproven since they are new. But as the microcomputer moves to 16-bit, CP/M and Oasis will encounter significant competition from both Pick and Unix, since these systems were originally designed for 16- and 32-bit systems.

Oasis is very similar to its minicomputer counterpart, the Pick operating system.

Pick. Pick was developed in Irvine, Calif., by Dick Pick of Pick & Associates and Pick Computer Works. It was originally implemented on the Microdata Corp. (McDonnell Douglas Corp.) 16-bit minicomputers. Pick is called Reality by Microdata.

Since its origin, Pick has been implemented on many other machines under a variety of names:

- Honeywell (Ultimate) for Level VI minicomputers.
- Prime Computer, Inc. (Prime-Information).
- Microdata (Reality). Reality is the name of both Microdata's 16-bit microcomputer and its operating system. The Reality operating system also runs on Microdata's 32-bit model, Sequel.
- Applied Digital Data Systems, Inc. (Adds Mentor) for a large micro-



IN DEPTH

PRODUCT CLASS	OPERATING SYSTEM						EXPANDABILITY			
	Unique	CP/M MP/M	Oasis	Pick	Unix	370	Memory (Bytes)	Mass Storage (Bytes)	Workstations	Cache Memory
Word Processor[1]	X	X		X	X		256K+	25M to 120M	1 to 32	
Personal Microcomputer[2]		X			X		64K to 128K	25M to 5M	1 or 2	
Small Business Microcomputer[3]		X	X	X	X		256K to 1M	5M to 120M	1 to 16	
Minicomputer[4]				X	X	X	128K to 2M	15M to 1G	1 to 64	X
Super Minicomputer[5]	X			X	X	X	1M to 16M	128M to 8G	1 to 256	X
Mainframe[6]	X			X	X	X	2M to 16M	4G to 16G	1 to 500+	X

PRODUCT CLASS	STORAGE MEDIUM			BACKUP MEDIUM			ADDRESSABLE STORAGE (Bits)					BASE COST
	Floppy	Removable Hard Disk	Winchester	S-Channel	Floppy	Tape Cartridge	8	16	32	48	64	
Word Processor	X		X	X	X	X		X				$ 5,500
Personal Microcomputer	X		X		X		X	X				$ 8,500
Small Business Microcomputer			X		X	X		X				$ 17,000
Minicomputer			X	X		X		X	X			$ 35,000
Super Minicomputer		X	X	X		X			X	X	X	$170,000
Mainframe		X	X	X		X			X	X	X	$500,000

Comments on Each Type:

1. Most are unique, but in the future their operating systems will become generic. These word processors are generally 8-bit computers now, but we are moving rapidly to 16-bit WP units. Most of the successful companies maintain a family of related and compatible products.

2. Our definition of a personal computer is a computer for one person. These units are also rapidly moving to the 16-bit class.

3. These units are multiuser, usually Winchester disk mass storage, and are rapidly moving to 16-bit CPUs. Very few exceed eight workstations, and only a handful can be expanded to 16. Most cannot be expanded beyond 40M bytes of mass storage.

4. Minis are rapidly moving to 32-bit CPUs and adopting Unix as the industry-compatible operating system. These units are easily expanded in both the number of workstations and the size of mass storage.

5. These units can run multiple operating systems concurrently while accessing the same files. They are always 32-bit, 48-bit and 64-bit systems. They use removable disk for backup, but will move to streaming tape as large Winchesters are used.

6. The mainframe is very little different from the supermini. The IBM 370 dominates this class. There is a major question as to which operating system will dominate the class in the future. The 370 is old. Some believe that Unix will eventually dominate this class, too. Others believe that the object-oriented architecture of IBM's System/38 will rise.

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• Altos Computer Systems, Inc. (Pick) for a large microcomputer. Scheduled for implementation in December.

• Digital Equipment Corp. (Ultimate) for LSI-11 hardware.

• IBM Series/1 (Pick).

• IBM 4300 series (Pick). Scheduled for implementation in 1983.

• IBM Personal Computer (Pick). Scheduled for implementation in 1983.

• Evolution Computer Systems Corp. (Pick).

• Hewlett-Packard Co.. (Pick). Scheduled for implementation in 1983.

• Data Media (Pick). Scheduled for implementation in 1983.

• Fortune Systems (Pick). Scheduled for implementation in 1983.

Pick is probably the easiest operating system to use. It needs very little traditional coding. Its data base management capabilities include a file creation utility, a procedure language, a retrieval language using English language sentence structure and an extended Dartmouth Basic designed for a data base management capability.

Pick uses variable-length records for more compact storage and virtual memory management for more flexible program utilization and development. This operating system is extremely efficient for data base applications in business-oriented functions. It is not very efficient in math or other CPU-intensive applications. Many of the same characteristics apply to Oasis.

Frequently, Pick is implemented in firmware in order to speed up its implementation.

Unix. Developed by Bell Labs, Unix is the most sophisticated of the generic operating systems to be covered. It was originally implemented in the educational environment under a special low-cost licensing agreement to colleges and universities. It is the only operating system that was implemented in a high-level language, the "C" language. Unix not only supports the C language, but also Fortran, Cobol, Basic, PL/I and others.

Certain licensees are permitted to modify the operating system for special development purposes. Through these special licensing arrangements, more than 200 special-purpose utilities have been developed. The Unix operating system supports word processing and a complete array of communications.

The system's primary drawback is that it is so sophisticated that very few versions are user-friendly. However, it is a DP professional's dream.

This operating system has had the broadest migration from its starting point, the 16-bit mini. It runs on IBM mainframes or personal computers. It has been implemented on many different vendors' models: Burroughs Corp.; IBM 370, 30 series and

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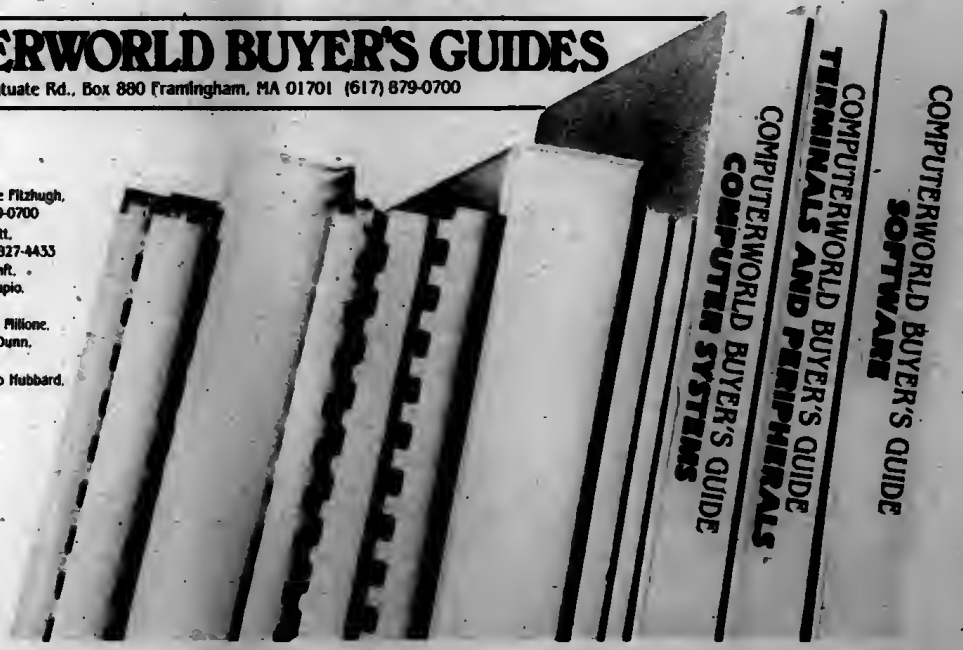


IN DEPTH

PICK	UNIX
Basic language (altered for DBMS)	C language
File-creation languages	Basic language
File-retrieval languages	Fortran language
Editor	PL/I language
Procedure language	Cobol language
Security systems	Data base management
Pick developed word processing	Electronic mail utilities
Variable length records	Complete communications compatibility
Virtual memory management	Photocomposition interface
IBM 2780/3780 and 3270 communications	

Operating System Characteristics

Series/1; Digital Equipment Corp. PDP-11, VAX-11/750 and 780; Data General Corp. Eclipse; Altos 16-bit microcomputers; and more than 25 other brands, including many of the microcomputers. The IBM 4300 is expected to support Unix in 1983.

By 1984, the Unix operating system is expected to have produced more than $4 billion in revenues from licensing fees alone for Bell Labs. Unix applications software for business is currently growing at more than 40% per year.

IBM 370. The IBM 370 operating system has been around for many years and has undergone modifications. These systems obviously have the largest installed user base from a dollar-and-cents viewpoint. The operating system market for the 370 is not growing in market share as much as Unix and Pick. IBM would probably like to switch to a more modern operating system like that for its own System/38, a Pick-like or Unix-like operating system, except that the users of the 370 have such an enormous investment in software.

Some of the new superminis and mainframes will implement more than one operating system, such as Pick and Unix, on one machine. This is a significant advantage because the computer can then present two faces to its users: one operating system for the simple data base management application, especially for the first-time user, and a more sophisticated operating system for the data processing professional. The sophisticated DP professional who develops applications software for user departments may wish to implement Unix for many more complex applications.

In the future, the implementation of Pick and Unix on the same machine will be rather commonplace. The box on this page lists some typical software characteristics of both.

Looking Ahead

As intercomputer communications grows in sophistication and the trend toward the "paperless" office spreads, compatibility among information products becomes a necessity. Users can expect a definite decline in those operating systems that are specific to a given supplier. There will also be less emphasis on two of the generic operating systems: CP/M at the low end and IBM 370 at the high end. The large systems will be running Pick and Unix concurrently, while the micros will be either one or the other, Pick or Unix.

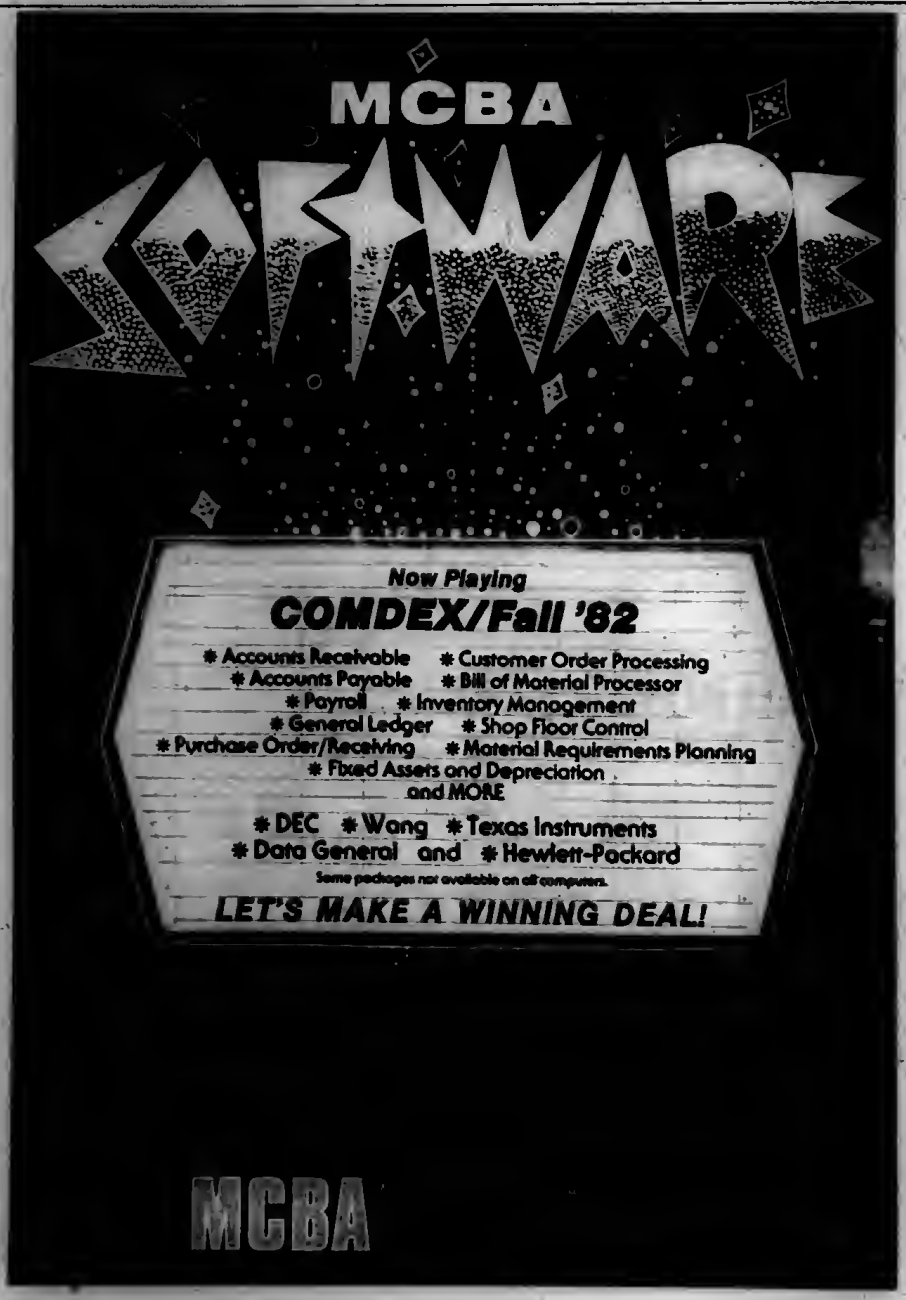
Within the next two years, a series of new word processing offerings will be implemented directly on the Pick and/or Unix operating systems. Many of these offerings will serve as the basis for distributed terminal systems. The user departments are likely to create more and more of their own applications via the Pick operating system. The sophisticated user and data processing professionals will be moving more and more to Unix for their complex applications.

From this author's perspective, these two systems will be the basis on which future compatibility will be built, uniting all information systems users.

About the Author

Paul G. Truax is president of Truax & Associates, Inc. in Wilmington, Del.

Truax has written two books on office systems design and is currently completing a third. He holds a B.A. from the University of Delaware.



SPECIAL REPORT

I/O: Preparing For Tomorrow Today

Edited by Tom Henkel

Nov. 29, 1982

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Data Entry Mart Expected to Double, But . . .

By Tom Henkel
CW Staff

FRAMINGHAM, Mass. — The market for data entry hardware is bigger than ever and the installed hardware base is expected to double by 1985. But don't be fooled. The data entry market is also in a time of upheaval.

CRT-oriented products have been replacing key-to-storage devices for some time. By 1986, key-to-storage products; such as remote batch, optical character recognition, keypunch, key-to-tape, key-to-diskette and key-to-disk, will have been overshadowed by CRT-oriented conversational, editing or processor-equipped units, according to a recent study by International Data Corp. (IDC) here.

IDC reports that the installed base of key-to-storage devices will dip to about 2% of the data entry devices installed base, while CRT-oriented devices will grow to about 98% of the installed base by 1986.

Strongest Share

By 1986, conversational CRT terminals, or limited function interactive terminals, will hold the strongest share of the data entry market with 22.4% of the installed base (Figure 1), IDC predicts. With 20.3% of the installed base, editing terminals (those with a buffer that allows entered data to be checked for errors before transmission to a processor) with IBM 3270-compatibility will comprise the second largest segment of the installed base.

Editing CRT terminals that connect to minicomputers or small business systems will hold about 16.1% of the market and conversational keyboard/printer combinations will account for 14.35% of the market, IDC reports.

Editing CRT terminals designed to attach to small business systems produced by IBM's former General Systems Division (GSD) will hold 9.6% of the market in 1986, and terminals used for clustered processing will account for 8.8%, according to IDC. Editing terminals designed for non-IBM mainframe vendors (namely Honeywell, Inc., Sperry Univac and Burroughs Corp.) will have the lowest percentage of the data entry marketplace (3.5%) in 1986, IDC predicts.

"The strength of the dumb terminal market continues to exceed IDC projections," the report states, noting that in 1981 the installed base of conversational terminals topped the million mark. Competition in the dumb terminal market has become intense, spawning a round of price cuts.

In order to stay competitive, some firms, such as Televideo Systems, Inc., have switched to building many terminals in foreign assembly plants. Other vendors, such as Data General Corp., acquire components from other countries, such as Yugoslavia and Mexico, for assembly in the U.S., according to IDC.

IBM's Share

IBM accounts for about two-thirds of the editing keyboard/printer terminal market with products like the 3767 — originally announced as a replacement for IBM 2740 and 2741 — the 3771 and 2770. The latter two products, however, were not initially successful and were eliminated from new production by IBM, IDC said.

Editing terminals are falling victim to newer conversational keyboard/printers which come equipped with optional line buffers and text editing capabilities. While basically dumb terminals, these products can offer limited editing capabilities at a price lower than conventional editing terminals, according to IDC.

The IBM 3270 and 3270-compatible marketplace is the biggest single segment of the data entry market. At the end of 1981, the study says, there were about one million 3270-type terminals installed domestically — about half of those terminals — about 24% of the total installed U.S. base (Figure 2) — were IBM. Marking a 28% increase over 1980, IDC notes that 3270s are being installed not only on new systems, but also for use on existing IBM and compatible mainframes.

IDC reports that IBM's GSD-type editing terminals, such as the 4790 and 5250 series, have a "tremendous potential for the future." As orders for the IBM System/38 increase, the market for GSD-type terminals will grow by about 20% a year. Furthermore, the installed base of GSD-type terminals will grow by about 28% a year through 1986, IDC predicts.

As for editing terminals for other vendors' systems, Hewlett-Packard Co. leads the minicomputer and small business systems market, shipping about 3,500 units a year. Wang Laboratories, Inc. comes in a distant second, shipping about half as many terminals as HP. IDC predicts a 20% annual growth for the small business and minicomputer terminal industry through 1986.

The market for editing CRT terminals for other mainframers rests on the fortunes of the mainframers. While IDC figures indicate that segment of the terminal market is growing at the slowest rate, the market research firm notes that the market is far from dead. In fact, the terminal market for other mainframers' systems will remain strong through 1986, according to IDC.

In the other mainframers' terminal market, Burroughs has the lead with about 34% of the installed base. Hon-

(Continued on SR/4)

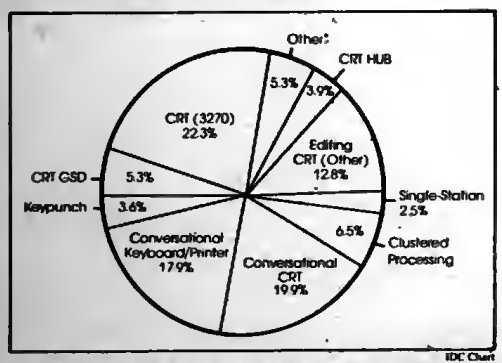


Figure 1: Total Devices Installed in 1981 (5,396,708). The category entitled "Other" includes remote batch (.4%), OCR (.4%), key-to-tape (.3%), key-to-diskette (1.4%), key-to-disk (1.7%) and editing keyboard/printer (1.1%).

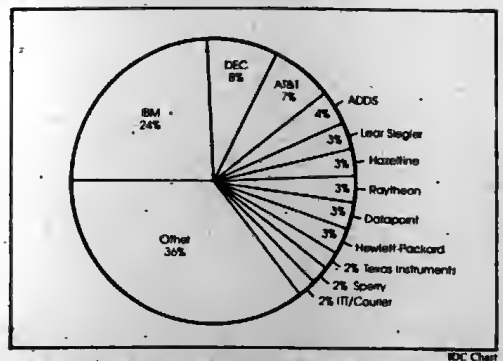


Figure 2: Total Number of Devices Installed in 1981 According to Vendor Market Share.

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Business Graphics or CAD

To Print or to Plot? It Depends on Application

By Tom Henkel
CW Staff

DELRAN, N.J. — To print or to plot? That is the question.

Everyone seems to be getting into graphics these days. Getting graphics out of the processor and into the hands of the end user ultimately involves some form of printer. According to a recent report by Datapro Research Corp., two clear choices of technologies stand out for graphics output: a graphics printer or plotter.

In the report, entitled "All About Graphics Plotters and Printers," Datapro points out that the application should dictate which technology to buy. In a business graphics environment, for example, the output provided by a graphics printer may be sufficient. But for computer-aided design applications, a graphics printer probably would be incapable of printing intricate and complex designs, according to the report.

Graphics plotters are best suited for printing drawings, charts, diagrams and similar graphics output. They differ from standard printers in that they are capable of printing more than just alphanumeric characters. The units were also designed to print pictures as opposed to printing text.

Plotters are certainly not newcomers to the DP marketplace. The units have been used in automotive and aircraft design, topological surveys and architectural layouts for years. Datapro notes that recent technological advances have made plotters cheaper, faster and smarter — to the point where they have become practical for graphics representations of business data.

Manufacturer	No. of User Responses	No. of Printers Represented	User Ratings* Overall Performance WA	E	G	F	P	Hardware Reliability WA	E	G	F	P	Ease of Operation WA	E	G	F	P	Print Quality WA	E	G	F	P	Noise Level WA	E	G	F	P	Maintenance Service WA	E	G	F	P
IBM all models	11	26	38	4	8	1	0	32	4	5	0	1	34	4	8	0	0	29	1	9	3	0	23	0	4	5	1	31	4	4	1	4
Hewlett Packard all models	4	8	33	1	3	0	0	33	1	3	0	0	33	2	1	1	0	30	0	4	0	0	23	0	2	1	1	33	1	3	0	0
Others	11	50	30	1	8	1	0	31	2	9	1	0	32	3	7	1	0	31	3	8	2	0	28	4	2	4	1	28	0	9	9	0
Totals	26	82	33	5	18	2	0	32	7	19	1	1	33	10	14	3	0	27	4	19	9	0	25	4	9	10	3	30	9	13	8	1

Source: Datapro Research Corp

As part of its report, "All About Graphics Plotters and Printers," Datapro Research Corp. surveyed 26 graphics-printer users (above) and 43 users of graphics-plotters (below). The users were asked to rate their hardware as either excellent (E), good (G), fair (F) or poor (P). Datapro then assigned each rating a numerical value, from 4 for Excellent down to 1 for Poor, to determine a weighted average (WA). The research firm noted that cross-totals may not necessarily equal the number of responses since not all users responded to every category.

Manufacturer	No. of User Responses	No. of Plotters Represented	User Ratings* Overall Performance WA	E	G	F	P	Speed WA	S	G	F	P	Accuracy WA	S	G	F	P	Hardware Reliability WA	E	G	F	P	Maintenance Service WA	E	G	F	P	Plotter Vendor Software WA	E	G	F	P	Technical Support WA	S	G	F	P
CalComp all models	12	4	31	2	12	0	0	27	1	8	3	1	29	2	9	3	0	33	8	8	1	0	32	3	9	1	0	32	2	11	0	0	29	0	9	3	0
Hewlett Packard all models	18	26	38	12	3	0	0	31	3	8	1	0	38	12	3	0	0	39	11	3	0	1	34	7	9	1	0	33	4	4	1	0	32	4	3	3	1
Nicolet Zeta all models	4	4	30	0	4	0	0	30	1	2	1	0	30	0	4	0	0	29	0	3	1	0	18	0	0	2	2	18	0	1	1	2	19	0	1	1	2
Tektronix all models	5	5	30	2	2	2	0	22	0	3	1	2	30	1	4	1	0	29	1	4	0	1	30	1	4	1	0	25	1	3	1	0	29	0	5	1	0
Versatec all models	3	3	33	1	2	0	0	37	2	1	0	0	33	1	1	1	0	33	2	0	1	0	23	0	1	2	0	27	0	2	1	0	22	0	1	2	0
Others	3	3	33	1	2	0	0	33	1	2	0	0	33	1	2	0	0	33	1	2	0	0	30	0	3	0	0	27	1	1	0	1	30	0	3	0	0
Totals	43	48	3.3	18	25	2	0	30	9	25	8	3	3.2	17	23	8	0	32	20	20	3	2	2.7	11	22	7	2	29	9	22	4	3	2.7	4	22	10	3

Source: Datapro Research Corp

Report Looks at Differences Between Graphics Printers

DELRAN, N.J. — Just as there are different types of graphics plotters, there are different types of graphics printers, too.

According to a recent report by Datapro Research Corp. entitled "All About Graphics Plotters and Printers," there are two general classes of printers — impact and nonimpact.

Matrix printers are an example of impact printers. The unit forms characters by hitting a series of pins against an ink ribbon. The pins can move very rapidly to reach print speeds of better than 200 line/min, the report states.

Nonimpact printers include: ink-jet, thermal, electrostatic and laser printers.

Ink-jet printers spray droplets of electrically charged ink through electrically sensitive fields to produce images. Thermal printers produce images by applying controlled heat to special paper. They can print upwards of 200 char./sec, though are very quiet. They only print single copies at a time, according to the report.

Electrostatic printers function when electrostatic charges are converted into small dots set onto a conductive paper. The resulting image is then treated with a toner. Electrostatic printers can achieve speeds of about 500 to 600 line/min.

Laser printers generate output by scanning data stored in a processor. Signals from a host processor activate a laser beam that scans across a drum or belt that is sensitive to light. The image is developed on the drum and transferred to paper. The printing method accommodates graphics material as well as text, Datapro said.

Now that vendors are equipping plotters with microprocessors, the units can be used to off-load some computational functions that traditionally have been handled by the host processor. With that in mind, Datapro says that up to 70% of the computational load can be given to a plotter. In the case of time-shared or remote systems, data can be transmitted in a highly compacted mode, thus reducing transmission costs and offering a higher plotting speed at the remote end.

Graphics printers, on the other hand, perform a dual function of producing alphanumeric, as well as graphics output. Many graphics printers offer color, but Datapro notes that color often lacks distinct contrast and intensity.

Most graphics printers are equipped with standard CPU interfaces, such as RS-232C, and many printers can operate either on- or off-line. Off-line printers often include a tape or disk drive, which usually boosts their purchase price. Datapro notes, however, that the cost savings of an off-line environment often offsets the increased price.

Like plotters, many graphics printers are now equipped with a microprocessor or are driven by a minicomputer. Datapro warns users to examine the available software for the graphics printer. Sometimes, software consists only of a set of Fortran routines that transmit preformatted data to the printer. If users want to integrate the printer into various applications, additional software development might be necessary.

The Datapro report costs $19. Datapro is located at 1805 Underwood Blvd., Delran, N.J. 08075.

Choosing the Plotter to Fit Your Needs

DELRAN, N.J. — What do you look for in a graphics plotter? In a recent report, Datapro Research Corp. classifies three basic types of graphics plotters: flatbed, drum and electrostatic.

Flatbed plotters take a somewhat straightforward approach to plotting. A flat sheet of paper is held in place, usually by a vacuum, and a writing instrument, which can move in two directions, draws the image. The units can draw on a variety of materials, including roll paper, photosensitized plates, film, glass, milar and linen. The advantage to the technology is that additions can be made to existing drawings. The disadvantage is that large drawings require large machines.

With drum plotters, the paper moves over a rotating cylinder to achieve one direction of movement. The writing instrument moves in the opposite direction. The advantage of drum plotters is that very long designs can be produced by a relatively compact unit. The drawback is that while many drum widths are available, very wide drawings usually cannot be produced, the Datapro report states.

An electrostatic plotter is similar to a drum plotter in that paper movement provides one direction of drawing. However, instead of a single pen, electrostatic plotters have a row of stylii across the width of the paper. The unit functions much like an office copier in that the stylii leave electric charges on special paper. The problem with electrostatic plotters is there is a limited choice of media onto which images can be produced, and images can only be printed in one color.

However, an electrostatic plotter's main advantage is speed. In fact, the machine can double as a high-speed printer when equipped with a character generator, the report said.

Participative Management Seen Best

Distributed Data Entry: Implications for MIS

By Kathy Brittain White
Special to CW‡

In today's computer environment, the responsibility of the management information systems (MIS) manager involves e diverse set of applications. Almost everyone in an organization is now involved in some way with data entry operations. As the quantity of systems users increases, user ownership of data becomes increasingly important.

One of the primary concerns of the MIS manager should be to develop standard procedures for data quality assurance and assist in the transition to user ownership of data.

Participative management is essential for end users and MIS personnel to coordinate the information process. The quality of the data input into a system is a key ingredient in the success or failure of that system. Users should be repositioned from the fringes of data entry to a more central role in information processing. MIS personnel and users should focus on and agree on the objectives of the system. Many firms even use what is called "the contract plan."

This plan involves written objectives that are signed by the MIS personnel and the users. These objectives serve as the guide for the system implementation and are periodically reviewed by all involved individuals. A steering committee can also be formed involving individual users as well as individuals from MIS in developing standard procedures. The most successful systems implementations reflect the technical viewpoint of MIS personnel as well as the viewpoints available from users.

Training should incorporate more than task performance. Any employee who will be involved in data entry tasks should have an understanding of where a particular task fits into the system flow. Training such as this, if provided by the MIS department, should be conducted by someone that is strong in oral communications skills. If the training is steeped in technical jargon, the users can be more confused after traioing than before.

MIS personnel should focus on eliminating irrelevant information from the data entry environment. Studies in human behavior indicate that the more information presented at any given time, the more complex the eovironment is perceived to be.

To improve the accuracy of the data entry operations, irrelevant information should be reduced in the following areas:

- **Screeo Design.** The less irrelevant information contained on the screen, the higher the accuracy rate will be when entering data.
- **Written Communications.** This can include procedure manuals as well as documentation. Include only what is oeeded to perform the task. Eliminate irrelevant and technical terms that do not enhance the user's ability to understand or perform the task.
- **Judicious Implementation.** Installing new systems "too much too soon" often causes resistance from users. Step-wise learnability is the process of managing one step of a task before proceeding to another. If the implementation of the new data entry procedures can use the process of step-wise learnability, a user can have an opportunity to be familiar with one new set of data entry procedures before learning another.
- **Current Technology.** Automation is very often postponed in favor of the futuristic technological advances promised by a vendor. Many times, users are asked to exist in their 1960s data entry environment until they can have access to 1990s technology. Install and make use of the best productivity tools currently available for data entry.

White is an assistant professor in the School of Business and Economics at University of North Carolina at Greensboro.

Union Carbide Goes On-Line to Save Time

CHICKASAW, Ala. — Data entry is often one of the last information processing functions to be brought up to the state of the art. This is due partly to previous investments in skilled labor and hardware, partly to resistance to change and partly to the large amount of CICS programming (and shortage of CICS talent) required to bring data entry up to date and on-line.

The Union Carbide Corp. manufacturing plant here recently reached e turning point in the evolution of its data processing facility. The firm's centralized data entry method was not keeping pace with the rest of its information processing system. The end users were not receiving the service they required, and the costs of this less-than-satisfactory service were growing, according to DP manager Don Philen.

The firm evaluated the various options in data entry and concluded that an on-line system would provide the most benefit to the largest number of users. More importantly, the firm would be able to realize a reduction in data entry costs and transfer the responsibility for the data to the respective user departments, Philen said.

The last hurdle to overcome was transferring all the existing data entry epplications, as well as several new ones that were backed up waiting for programming, to the new on-line system.

Using TSI International's Key/Master data entry package end existing IBM 3270-type terminals, the data entry supervisor, with the aid of a technician, developed 75 applications and tested and documented them in only 21 days without any programming. This avoided many months of CICS programming and allowed the data entry function to be brought up to speed, Philen said.

The relatively high monthly costs for hardware and staff that were formerly devoted exclusively to data entry, as well as the extended turnaround times the DP shop had experienced, were replaced with e few 3270 terminals.

On-Line vs. Off-Line

Implementing Data Entry Systems

By Roger D. Hoff
Special to CW‡

Today there is a trend to make everything interactive. But there are still some aspects of data entry that cannot easily be implemented in an interactive mode.

Take large-volume transaction epplications, for example. When there is a large volume of work and little time for data capture, e data entry subsystem is often the best solution to the problem.

There are other ideal situations for data entry systems. Firms with a wide geographic dispersion of data often need collection at a central point.

Applications that require validation of data are just two examples of situations that often require off-line data entry.

Even with unlimited computing resources, on-line update is not always the answer. A batch processing system, however inelegant, may be the best solution.

Another Problem

After deciding upon the need for data entry, the system designer will be faced with another problem. Let's say the company has purchased a system with terminals for every conceivable workstation, but the system software was designed to support on-line real-time interactive processing.

The system is great and everyone loves it, but meanwhile the system designer wants to capture data at a rate of 10,000 to 12,000 keystrokes/hour.

One obvious answer is to obtain a dedicated deta entry device to support the application being implemented.

Unfortunately, that answer requires significant monthly expenditures, takes up valuable floor space and has its own separate training and maintenance problems. The better answer, in many instances, is to go back and reexamine the already installed general-purpose computer.

If the application system demands fast data capture rates, blind verification would be the best method of assuring correct data entry, with in-place terminals the preferred input device.

The evailability of a software-based data entry system can justify each of these system demands.

Fastkey, for example, is a data entry system for the Hewlett-Packard Co. HP 3000 system. This system was designed to replicate the functioning of single-purpose data entry equipment, but utilizes the basic terminals attached to any HP 3000 processor.

Data entry screens are created through an interactive dialogue. After specifying transaction forms, data field characteristics and other minimum parameters, data entry can begin immediately. Data is captured in oser-defined batches and can be selectively released based on batch type and status (keyed, verified or released).

Hoff is vice-president, marketing, for Beta Information Systems, Inc., based in San Rafael, Calif.

Study Says Data Entry Mart In Era of Growth, Upheaval

(Continued from SR/2)

eywell and Univac ere virtually tied for second place with Honeywell accounting for 26% of the market and Univac 25%.

IDC expects stronger competition from independent editing terminal manufacturers over the next few years.

Leading the pack in the independent group is Hewlett-Packard Co. with about 17% of the market. Wang Laboratories, Inc. came in second with about 13%, followed by Lear Siegler, Inc. end AT&T, both with 9% of the market.

Hazeltine Corp. came in fifth with about 8% of the marketplace, IDC said.

The IDC report is called "Statistical Reference Book: Terminal/Data Entry Market 1982."

The book is offered as part of IDC's Corporate Planning Service. IDC is located et 5 Speen St., Framingham, Mass. 01701.

Three Firms Expand COM to Fit Needs

By James N. McKay
Special to CW‡

Subtle changes are taking place in the operation and output of computer output microfilm (COM) units. Some are leading to the use of COM in new applications, while others expand on the advantages of microfilm. One trend is an expansion in the use of 16mm microfilm for COM applications. Many microfilm processors sold today are configured to produce both microfiche and 16mm microfilm. COM production has traditionally been dominated by microfiche; however, long-run applications are being converted to 16mm film on which 5,000 or more images can be contained in one single 4-in. by 4-in. by 1-in. film magazine.

An example of this is happening at Connecticut Natural Gas Corp., a 122,000-customer public utility headquartered in Hartford, Conn. About the only paper used in its customer-billing applications is the invoice that is sent to the customer. All of the backup data is either in the computer (15 months of billing and records of the last five service calls) or on 16mm microfilm. Customer service representatives who answer telephone or written customer inquiries check their terminals first. If the information is not there, they can check microfilm records dating back to 1972.

Connecticut Natural Gas organizes its microfilm files by billing cycle and customer account number. This makes it easy for the customer service representatives to locate specific records for specific time periods, or even to reconstruct a customer's entire billing record. Automated terminals are all that is necessary to retrieve images from this film file.

Automated Retrieval

One reason for the growth in the use of roll microfilm for COM applications is the availability of automated retrieval. Most microfiche retrieval is manual, while the COM can apply coding for automated roll retrieval directly on the microfilm at the same time it creates the image.

Three forms of coding can be applied by microfilm processors. One is a bar code similar to the Universal Product Code seen on packages at the supermarket. Another is a simple image mark that a microfilm terminal counts as the film passes through. A more sophisticated method is an expanded image-marking technique that uses different-size image marks to separate the records into three different categories. In many financial applications, this means that microfilm can match the block, batch and item organization that already is used by the computer.

Remote operation of COM is another trend. This is the case when the computer is in one location and the generation of the microform is needed at another. For example, the Eau Claire, Wis., data center of First Wisconsin Bank, which is about 250 miles away from the bank's Milwaukee data center, acts as a service bureau for a number of smaller institutions in its area. Data entered through the Eau Claire center is processed in Milwaukee, and the finished reports are sent back to the remote center over telephone lines.

An Eastman Kodak Co. Komstar microimage processor in Eau Claire is on-line to a host computer in Milwaukee. The processor then controls printing of the microfiche as if the COM were in the next room instead of 250 miles away.

While most of the reports that are output through COM today are for administrative use, there is a growing use of COM reports within data processing departments. Systems outputs (Sysout), such as memory dumps, operation logs and program documentation, which take up so much space in paper form, are now being retained on microfiche or roll microfilm.

One reason for the growth in the use of roll microfilm for COM applications is the availability of automated retrieval. Most microfiche retrieval is manual, while the COM can apply coding for automated roll retrieval directly on the microfilm at the same time it creates the image.

Conversion of these applications to microfilm is often the result of having installed an in-house COM. Carborundum Corp. of Niagara Falls, N.Y., originally used a service bureau to produce its COM reports. As the need to change more paper printout applications to microfilm grew, the data processing department justified installation of a microimage processor. Today, much of the operating job control language that operates Carborundum's host processor is

(Continued on SR/6)

Nobody offers you a wider variety of computer printers and printer experience than Facit/Dataroyal ... all the way from low cost ($695 list) matrix printers, to sophisticated graphics and color matrix printers, to models that print variable size characters and bar codes, to "daisy wheels" and a multimode near-letter quality printer. Industry standard parallel and RS232C serial interfaces are available in all printers.

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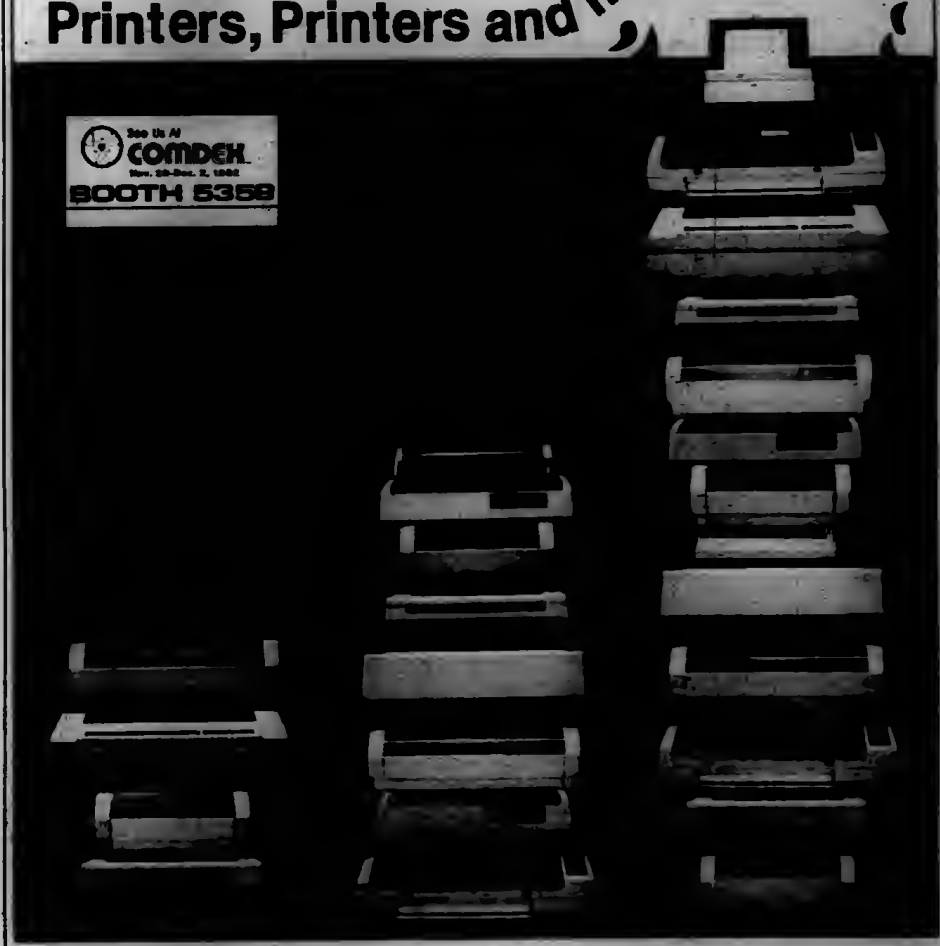

Two Companies Report Success

COM a Viable Alternative to On-Line Inquiry

At least two large companies have determined that computer output microfilm (COM) is an economical alternative to on-line inquiry systems.

Robert De La Cruz, group vice-president in charge of information distribution at Merrill Lynch, Pierce, Fenner and Smith, Inc., said that while the firm wants as much on-line access as possible, putting the whole company on-line would cost too much. As an alternative, some parts of the firm are using COM.

Many data managers automatically opt for an on-line inquiry system without realizing just how similar the data processing procedures are for both on-line inquiry and COM.

Robert Blitz, manager of micrographics at Ingersoll-Rand Corp., explained the process at his firm.

"If you assume that the data processing will take place between 4 p.m. and 8 a.m., as it does in most operations, you can run through the same procedures for both on-line inquiry applications and COM applications.

"Between 4 p.m. and midnight, you can enter the data base [or user update requirements] into the host computer via keypunch cards or diskettes. You can then process this data on the host computer over the next few hours." Using this method, users start out each day with a fresh set of data, according to Blitz.

Ingersoll-Rand examined the costs of both systems in a detailed analysis that took into account equipment and operating costs for both on-line inquiry via CRT terminal and COM inquiry via microfiche reader. The company determined that, using an estimated 300,000 transactions per year and a 500,000-record data base, on-line inquiry would cost more than $49,000. These costs include the purchase and write-off of 20 CRT terminals, a one-time charge of $2,000 for cables and $18,000 for transaction costs.

COM costs would include the purchase and write-off of 20 microfiche readers and one reader-printer, as well as $10,000 to produce and access information on the microfiche, for a total annual operating cost of less than $11,000, Blitz said.

Storage Space Strain

Until the late 1960s, Merrill Lynch did not use COM, although the firm was using source document microfilm for storege of printed documents. At one point, the firm began to film customer statements to relieve the strain on storage space created by the 500,000 accounts processed each month.

At about this time, the firm began to explore the possibility of directly filming the computer output, via COM, instead of first printing on paper and subsequently filming the paper with a rotoline system, De La Cruz said.

Since Merrill Lynch was using 16mm film for source document work, the firm produced its first COM output on this format as well. Later, the firm decided 105mm microfiche would be a more economical format when compared with the time-consuming and expensive procedures involved with cartridging and retrieving data on 16mm film.

(Continued on SR/8)

IS YOUR BUSINESS SUFFERING FROM TERMINAL ILLNESS?

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Case Histories Of COM Use

(Continued from SR/5)

stored on microfiche. More than one-half million frames of Sysout are now printed there each month.

Two other COM users, one an insurance company and the other a major New York bank, combine remote job processing and remote printing of Sysout on COM. In both cases, their programming staffs are in buildings other than their computer centers. On-line terminals are available for testing and, because of the storege efficiency of microfilm, on-line COM is available to print out program compiles and other programming documentation.

Finally, COM pioneers are replacing older, wet-process COM equipment with heat-processed microfilm. Because there are no liquid chemicals, the new equipment is often installed in the computer room right next to the paper printers. The computer operators also operate the COM units with very little additional training.

McKay is director of COM field sales support with the Business Systems Markets Division of Eastman Kodak Co., Rochester, N.Y.

Color Applications Growing Full Spectrum

By William B. Elmore
Special to CW‡

For many years, the use of color in computer applications was limited to specialized applications in computer-aided design and other high-end applications. Recently, however, color terminals, software and color hard-copy devices have become available that allow color to be used in more general-purpose applications such as data entry, transaction processing, data base inquiry and report generation.

Users have long recognized the inherent benefits of color in computer applications. Color improves user productivity through increased data comprehension, offers decreased error rates and creates a more interesting work environment. Until recently, however, the high price of hardware and the lack of software have limited the usefulness of color in most office and data processing applications.

Now, with rapidly falling prices, increased availability of software and new color hard-copy devices, color is becoming more common. Various market research reports predict that by 1986 30% to 70% of terminals sold will be color terminals.

There are a number of applications for color, including a wide range of both business and engineering areas. There are very few applications in which the use of color cannot improve a user environment.

In the business environment, the primary use of color has been presentation graphics for business graphs and charts. Color will rapidly be incorporated in a wider range of business applications, including decision support, data entry and retrieval, transaction processing and financial application systems.

Color can be used for a wide variety of management information systems applications to summarize large amounts of data, data that can show trends and error conditions. A typical data entry application might use different colors for the form itself, the data entered and any error messages from the system. Items that are being changed or corrected might be displayed in yet another color. In accounting, all accounts receivable over 60 days might be displayed in red for easy identification.

The addition of graphics to most business applications usually improves productivity and comprehension of data. For example, the report the manager receives at the beginning of each week or month can be analyzed much more rapidly if preceded by a series of color graphics summarizing the data. With the information summarized in graphics form, the manager can quickly determine which areas of the report can be scanned or require in-depth analysis.

In addition to business applications, the use of color will be expanding in a number of other applications areas, including computer-aided manufacturing and design, medical and scientific applications.

Color alphanumeric terminals that provide highly intelligent features as well as color capability can now be purchased for less than $3,500. The use of color in traditional alphanumeric applications can be cost justified in more and more cases.

Primary targets for using color include applications in which data entry accuracy is of key importance, large amounts of data are displayed (from which particular items are to be selected) and data items are grouped by certain attributes. These applications span a wide range of environments, including hospital management, banking and finance, transportation and manufacturing.

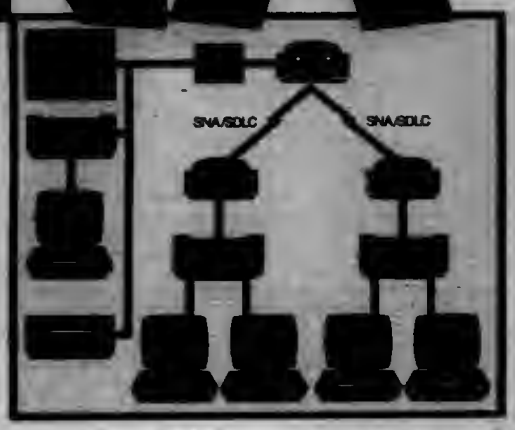
A great deal of product development is currently under way in the area of graphics software. Of primary importance are the products from a number of third-party software vendors, including Issco, Precision Visuals, Inc. and Megatek Corp. These vendors provide powerful graphics software packages that run on a variety of popular minicomputers and mainframes. The packages are usually the fastest and most cost-effective way to bring graphics to the user environment.

In addition to the general-purpose software packages, a large number of applications software packages for financial management, manufacturing systems, word processing and transaction processing that support color and graphics will soon be announced.

The single greatest factor prohibiting the penetration of color into general-purpose applications is the lack of cost-effective color hard copy. The type of color hard-copy device needed should be reasonably fast, able to perform both alphanumerics and graphics, has monochrome printing functions and high-quality alphanumerics capabilities.

Elmore is vice-president of marketing at Envision Technology, Inc., San Jose, Calif.

SNA:



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Merrill Lynch 'Bullish' on Economy of COM

(Continued from SR/6)

Microfiche would also provide the easy access to the data that the employees required. In 1976, the firm converted to the 105mm microfiche format, De La Cruz said.

Merrill Lynch also switched from 16mm roll film to 105mm microfiche. That move resulted in dramatic savings for this large financial organization, according to Fred Sayage, the firm's micrographics manager.

"Now we produce only microfiche, and we do a tremendous volume — nearly 100 reports each day, some of which are very long, and many other reports that are produced on a weekly, monthly and annual basis," Sayage said.

The greatest growth area for micrographics at Merrill Lynch has been the firm's Cash Management Account (CMA), an area of the company which has substituted COM for CRT terminals as a data retrieval mechanism.

To support the CMA program, customer representatives are on the phone daily, answering questions and making data inquiries to satisfy customer requests about their accounts. The account inquiry operation is located in New York, with toll-free access by Merrill Lynch's customers to more than 50 customer representatives, De La Cruz said.

Microfiche, rather than on-line inquiry, is the primary tool used by these employees. Soon after the monthly cash margin statements are mailed, the CMA customer service group receives as many as 5,000 calls a day for information that can be quickly and inexpensively retrieved from microfiche. These microfiche are produced in-house on eight Datagraphix, Inc. 4560 COM recorders with several Datagraphix Datamaster microfilm microfiche duplicators.

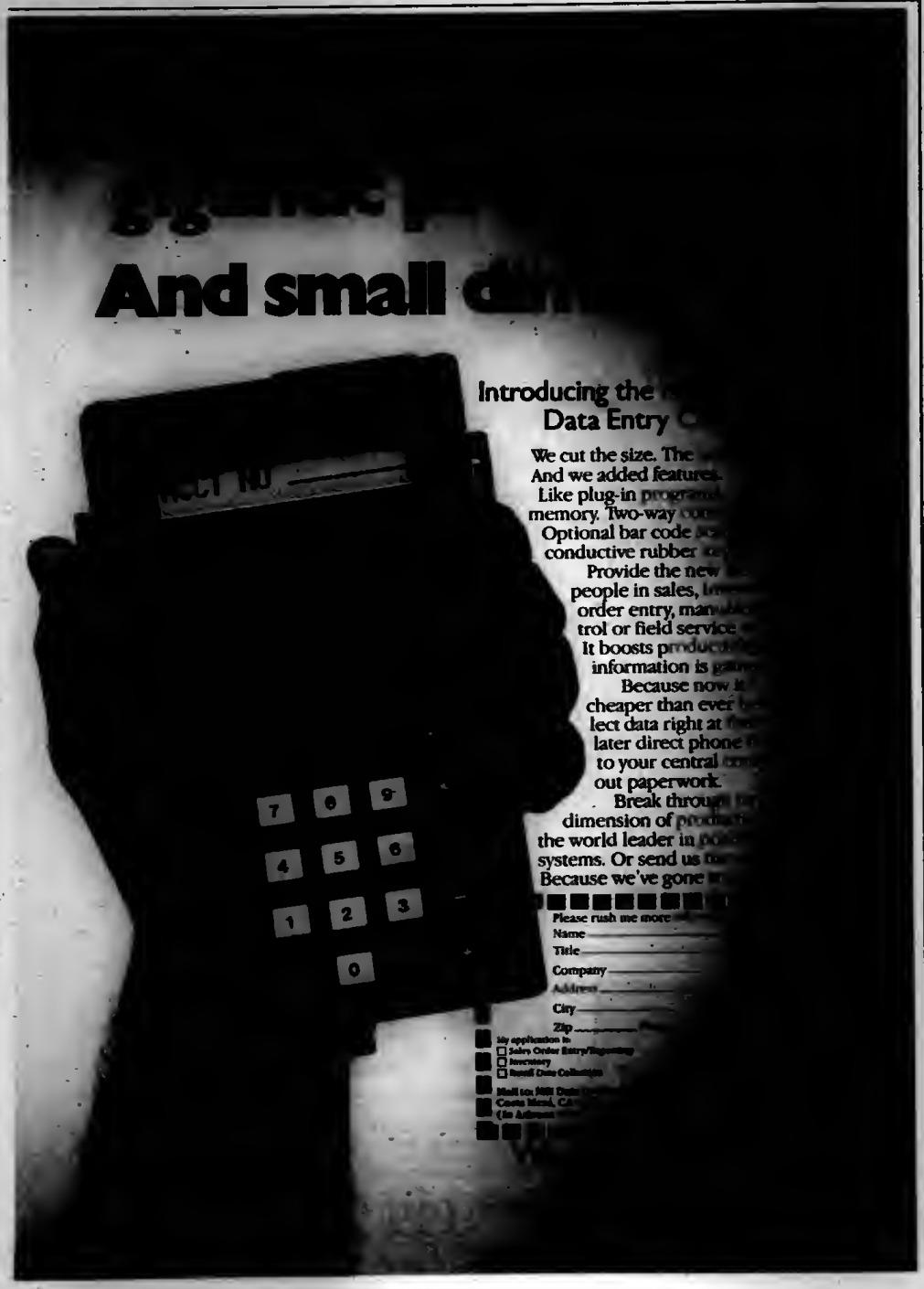
Microfiche production at Merrill Lynch is similar to displaying data on a CRT terminal. The information is keypunched into the data file, a tape is produced, the tape is mounted on the microfiche records and output is created. For an on-line CRT system, the tape and COM steps would be eliminated. However, with COM output at speeds up to 20,000 line/min., and with duplication at 1,500 copies per hour, the firm's third-shift operation can easily meet the 8 a.m. deadline, De La Cruz said.

Ready Access to Data

Microfiche duplicates are then distributed to each customer representative in the account inquiry department. Each person in this group has a microfiche reader on his desk, so access to the data is always readily available. The entire data base is printed with updated information daily. Therefore, only current and accurate data is referenced, as would also be the case with an on-line system, De La Cruz said.

"Using microfiche has allowed us to respond to customer needs quickly," Sayage explained. "We can produce the output here in our micrographics operation, distribute it throughout our main office and to our many branches for a fraction of what it would cost to mail the same data on paper . . . and we are assured that our customers can receive the information they request quickly.

"Cash Management continues to grow here at Merrill Lynch," he continued, "and we are exploring many new areas for COM usage. We are currently in the process of putting our individual retirement accounts and Keough accounts on microfiche, and we expect further increase in our microfiche production."



Going 'Multimedia' May Be Cheaper

OCR Advances Widening Applications Horizon

By Bruce W. Johnson
Special to CW‡

Recent advances in optical character recognition (OCR) technology have dramatically increased its applicability to a broad range of data entry functions. New products have in turn created a new profile of the kinds of industries and applications in which OCR will become the preferred data entry technique.

Modern OCR data entry systems operate as stand-alone, off-line units. With their own microcomputers, these systems not only read, but also edit and format data at its source. All this local power results in clean data arriving at the host. Actual transfer of data can be accomplished either through intercommunication or via interchange media such as floppy disk or magnetic tape.

'Multimedia' Systems

Another important development has been the introduction of "multimedia" systems. These systems combine OCR with more traditional key-to-disk capabilities. A single multimedia system is often less expensive than separate OCR and key-to-disk systems because it shares the cost of common elements such as the processor, memory and disk.

Combining the speed and low-cost of OCR with the flexibility of key-entry, multimedia systems make it possible to match data entry tools with data entry tasks. On a typical remittance stub, for example, OCR is the ideal data entry technique for reading most of the data — account number, balance due and minimum payment.

However, traditional key-to-disk is the best technique for entering the address changes that appear on a small portion of the remittance stubs. With a multimedia system, each type of data can be processed by the optimum data entry technique.

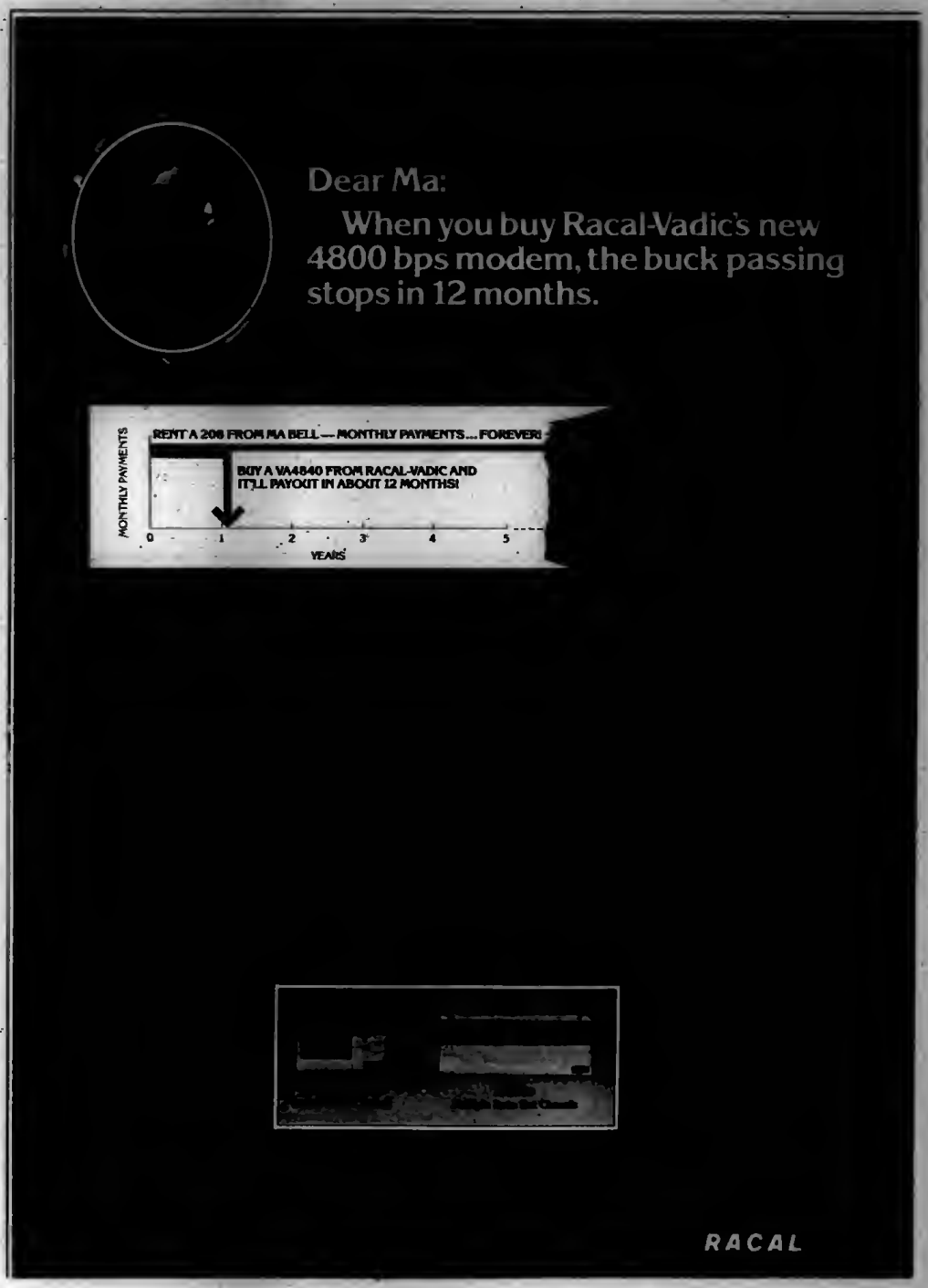
Perhaps the most important recent development in OCR has been the dramatic improvement in the ability to read alphanumeric handprint (unconnected numbers and capital letters). Crude handprint capabilities have been available for many years. The old handprint systems required the user to observe a host of special conventions — size, extra tick marks on particular characters and so on. Cynics have argued that these early alphanumeric handprint systems required users to draw rather than write.

As computer technology has advanced in recent years, OCR manufacturers have utilized cheaper, more powerful components to develop fundamentally new approaches to the problem of character recognition. Scan-Optics, Inc., for example, recently began field installation of alphanumeric handprint systems that use advanced topological analysis to solve classic data entry problems.

With so-called "friendly" alphanumeric handprint, OCR becomes a viable data entry approach for a wide variety of turnaround documents. Some of the handprint applications developed so far include payroll, order entry and warranty card processing.

Another major advance in the sophistication of OCR data entry systems has been the development of video imaging capability. When the optical character recognition reader is uncertain about a character definition, it can store a digitized im-

(Continued on SR/12)



But, Is It Better Than On-Line Data Entry?

Insurer Claims OCR Cost-Effective, Efficient

By Leonard Rittner
Special to CW‡

CAMBRIDGE, Mass. — Updating the files of millions of insurance policyholders is not an easy task. Every time a salesman contacts a policyholder, usually every six months, the policyholder master file must be updated.

However, at Combined Insurance Co. of America here, we found that such updates could be performed more efficiently and cost-effectively by using optical character recognition (OCR) technology, as opposed to the more popular on-line data entry systems.

The classic way of handling this situation is during the billing cycle when a computer-generated document is being sent back to the computer and is being used as a data entry document. This eliminates or minimizes keypunching.

The best way to carry out this application is to use a notice that is prepunched when sent to the customer. This prepunched number relates to all the billing information so that when the turnaround document is sent back to the home office, it is directed to the outstanding file that contains all the detailed information on the customer account. The data is then updated onto the master file.

While many companies use this system, there are some problems with it, not the least of which is the manufacturer's difficulty in having 100% control of the prepunched numbers. There are also restraints on the size of the document to be used if it is to be processed by standard equipment.

In order to allow for more flexibility and better control while reducing costs, Combined Insurance searched for a viable alternative. We chose to scan the documents.

OCR Use Controversial

The use of OCR is controversial. In the past, users have been faced with such reliability problems as uneven reject rates. Many companies consider OCR to be an obsolete technology; on-line data entry appears to be the more popular choice. Combined Insurance, however, considered OCR to be the more viable alternative for its applications.

A study of the availability of scanning equipment quickly revealed that the units that allow scanning of an entire page of information were either too slow, very expensive or both. It became apparent that what was required was a "line scanner" — that is, a machine that would scan only a selected line or two of the document at fairly high speeds and at a low cost.

After looking at about 40 vendors, we decided on OCR readers developed by AOM Corp., based in Birmingham, Ala., a company heavily involved with remittance processing. The devices were specially designed for Combined Insurance for use in a batch processing mode with our IBM 4341 Model 1 processor.

'The use of OCR is controversial. In the past, users have been faced with a variety of reliability problems, including uneven reject rates. In fact, many companies consider OCR to be an obsolete technology, prefering instead to choose on-line data entry as an input technique.'

The scanners are used primarily for direct-mail billing. When the billing document is returned, along with a payment, the check and bill are matched and balanced after the check is encoded.

By working closely with AOM, we developed engineering modifications to the production machine that would allow it to handle large-size documents while still taking advantage of the line-scanning concept. Since the company has multiple operations and needed a number of OCR readers, it was necessary to keep the machine cost in the $50,000 range. We were able to do this and still maintain rated speeds of 3,500 to 4,000 documents per hour. Other machines reviewed cost from $125,000 to $200,000 per machine.

The end result has been quite favorable. We have been able to modify effectively production machines — in effect customizing our specifications to meet our applications needs.

Rittner is a vice-president at the Hearthstone Division of Combined Insurance Co. of America, based in Cambridge, Mass.

Registry Uses OCR to Boost Productivity Of Data Entry Without Enlarging Staff

BOSTON — Optical car registration? Not quite, but here at the Massachusetts Registry of Motor Vehicles, an optical character recognition (OCR) system is being used to process automobile registration, accident reports and driver's license applications.

The registry processes more than eight million documents per year. Over the past eight years, the volume of registrations increased to the point that the existing data entry equipment had reached its capacity. At the same time, budget cutbacks forced reexamination of staffing levels.

Faced with the need to continue serving the public efficiently, the registry examined new ways to process the volume of records, according to Fred Cody, chief of highway safety. After an exhaustive analysis, the registry concluded that an OCR system would be best suited to increase data entry capacity without increasing staff.

Two-Step Approach

A two-step approach was chosen whereby licenses were first processed by an optical character recognition system at an outside agency. When the initial testing proved successful, the registry released a request for proposals. After a thorough review of equipment capability and cost, the registry chose a Scan-Data Corp. system, Cody said.

The registry receives 4.5 million automobile registrations and 3.2 million driver's license applications per year. In order to process these documents more efficiently, the registry must be able to service fluctuating volumes and manage periods of peak activity without significant backlog. Source information must be located quickly in the data base so that a timely document turnaround is ensured.

The documents that the registry processes are used for identification purposes and must be accurate. Items such as hair color, eye color, spelling of name, address, and Zip Code are essential to the usefulness of these documents. How to process effectively this information without confusion and without the need to redesign costly forms was the major problem that confronted the registry, Cody said.

The OCR system can process various document sizes, enabling other state agencies such as the Department of Public Safety, the Criminal History Systems Court, the Department of Public Health and the Offices of Management of Information Systems to process their applications as well, thereby decreasing the number of steps in the critical path to four, reduced from a previous eight-step procedure. This reduction of steps in the process not only increases throughput, but lowers the incidence of error probability, Cody said.

The system directly scans licenses, registrations and other agency documents and stores the collected information on disk. Misreads that might result during the scanning process are prevented by extensive edits incorporated into the scanning program and the documents themselves, Cody explained.

The optical character recognition system can easily process more than 10 million assorted documents per year without backlog. Work loads may be transferred to other terminals for best utilization of personnel, Cody added.

Applications For OCR Grow

(Continued from SR/9)

age on disk.

In the hands of creative applications programmers, video imaging can be used to simplify forms and procedures. For example, a labor reporting ticket might contain room for a free-form, handwritten explanation of an absence — sick time, vacation time and so on.

The OCR system could be programmed to store the video image of this entire field whenever it is not blank. A keyboard operator could then translate these free-form descriptions into appropriate code numbers.

The net result is that codes for special cases need to be known only by a few operators, not by all employees.

Johnson is director of marketing at Scan-Optics, an E. Hartford, Conn.-based OCR firm.

Defect in MVS

Unfortunately, IBM designed MVS with a defect in it that penalizes installations during tape mounts and other people-oriented interactions. It wastes CPU time, memory, and throughput.

A new field, Operations Performance Analysis, is evolving to spot problems in personnel, devices, and scheduling while providing justifications for hardware changes and computer room reconfigurations. Nearly 100 Operations Managers are solving bottlenecks in people and equipment through use of a new, innovative software product, OPMAN, that automatically gathers data on an installation and produces exception reports, management summaries, and action-oriented warnings for each shift. Data-center executives can see how long it takes operators to mount tapes, disks, forms, or respond to WTOR's.

For more information on the Defect in MVS and sample OPMAN reports contact:

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In-House CPU Ensures Storage Space to Spare

WASHINGTON, D.C. — Keeping insurance agents informed of industry trends and evaluating their field performance through card-entered data is one of the ways an insurance agency here is using its recently installed in-house processor to save time and improve productivity.

Wallace Associates, an agency connected with the Home Life Insurance Co. of New York, has used a time-sharing system for the past 10 years. But the agency's management decided the time-sharing system did not offer enough storage and did not allow the firm to build the kinds of data bases it wanted.

The sales survey is a case in point. In the course of a year, Wallace Associates accumulates data on about 2,000 to 2,500 policies. "The storage file became just exorbitant," a company spokesman said. "The survey was originally designed to run on a quarterly basis, but we had to back off and run it only once a year. What we would do during the course of the year was have an operator put the data on magnetic cards.

"Come November, we would work 12 or 14 hours a day, inputting all of the information. We'd have the reports generated at the service center and mailed back to us because our printer was too slow," the spokesman said.

Moving In-House

Moving to an in-house computer promised a solution. The company looked at several firms' systems and found Wang Laboratories, Inc. to be the most progressive and the firm most likely to deliver what Wallace thought it wanted. The agency installed a Wang 2200 VP computer with 32K-bytes of main memory, a 10M-byte disk drive, a diskette drive, a CRT display terminal, a daisywheel printer and a telecommunications interface, the spokesman said.

The VP Wang processor handles policy and pension illustrations, along with Wallace Associates' management information programs. For insurance proposals, the agency uses a software package designed by an independent software company, Sigma Software, Inc., to run on Wang computers.

The telecommunications interface provides direct access, through the Wang workstation, to the pension software system Wallace had commissioned earlier. To get an illustration, an agent simply fills out an input form. For complex pension cases, the agent will work out input data in consultation with a specialist. An operator then keys the data into the computer and prints out the requested illustration, the spokesman said.

Clients benefit from the system because agents now have a wider choice of policy variations. Because an agent is not too concerned about on-line charges, he can look at two or three illustrations, or look at the same policy and different ways of paying for it, to see which is a more beneficial plan to propose.

The sales survey is now produced quarterly instead of once a year. Weekly data entry into the Wang processor has replaced the year-end rush of feeding magnetic cards into time-sharing equipment. When a paid-for card arrives for a policy, it is attached to the input form that is created at the time of the initial policy application. The operator checks for changes in the way the policy was written and keys the information on the insured, the policy and the sale. The company can build the file at any point and can also get summaries by the month — just about any way it wants to pull them out, the spokesman noted.

For agents and for management, the survey is an important planning tool. "A salesman may be making most of his sales in an area where he's spending the least amount of time, but he doesn't know that necessarily until he sees a report. The name of the game is helping people to grow in the sales area," the spokesman said.

That is also the purpose of Wallace Associates' Career Success Plan, which takes a somewhat different approach. The plan is an activity tracking and evaluation system for people in their first four years with the agency. It produces weekly updates on their work, from calls and appointments to the policies they write and the business that is paid, according to the spokesman.

That data is measured against a goal that the agents established for the year. It tells them whether they're on track, ahead or behind. The plan also tracks some internal data, such as ongoing education.

Participating agents keep the record of their work on special forms. The forms are due for data entry at 2 p.m. each Friday. An hour later, sales managers can review the finished reports with their agents and help plan schedules for the week ahead, the spokesman said.

Now that the basic management support programs are in place, the computer committee is making plans to broaden sales and marketing support. A deferred compensation package is in preparation. The agency plans to increase system memory in stages to 64K and may eventually upgrade to an MVP with several workstations, the spokesman said.

Helps Increase Speed, Accuracy

FSP Technology Improves Employee Skills

PHOENIX — For at least two users, a software technology called a full-screen processor (FSP) has improved data entry accuracy and speed among nontechnical employees.

"Without FSP technology, our use of data base management architecture to create the user-operational systems we have today would have been virtually impossible," said Jim Manchester, manager of research and development for Quality Inns International, based here.

"In the year since we have applied the FSP built into the [Infodata Systems, Inc.] Inquire information resource management system, we have put together several important systems, most notably a hotel master data base file to track all of our properties with all of their characteristics.

"Details include the normal items such as rates and size of the property, but there are also extra items such as whether sight-seeing tours are available in the surrounding area," Manchester explained.

"We recently were able to put together a complete convention registration system; building data bases and data entry screens for one of our users in Silver Spring, Md. The whole process was done by nontechnical people in less than three days. Data was entered and updated by the users themselves from Maryland."

'A Lot of Code'

"The alternative to FSP would be to use IBM's CMS with their Display Management System [DMS], plus a full-screen interface, and then write procedure language programs for update. You'd just plain have to write a lot of code," Manchester said.

"The user doesn't want or need to write code to do his job, so without FSP, the DP department would again be saddled with a flood of requests, or worse, the applications would go unfulfilled. FSP removes the coding from the process, and thereby puts the user in touch with his own information."

At the Allergan Pharmaceutical Co. in Irvine, Calif., Jeff Kouba, a systems analyst for the firm, is using the FSP linked to the data dictionary to develop end-user systems.

"In the short time we have worked with the FSP, we have seen definite increased usage in user-driven systems. Before Inquire, we had been using CMS and DMS. The user could build application screens with DMS, but was forced to work through individually written programs to access specific panels," Kouba said.

"Once accessed, data on the panels was modified and then returned to the data base. With FSP, we have eliminated most of those steps."

Kouba explained that Allergan currently has 25 large user-driven systems, a number that he predicts will increase significantly in the next year.

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WP Speeds Up Turnaround Time

DA Wants More Complaints From System

RIVERSIDE, Calif. — All Don Inskeep wants from his system are complaints.

Inskeep is the Riverside County chief deputy district attorney. His district covers 7,176 square miles and includes nine cities. The problem was how to gather complaint and police reports from each city, type them into official complaints and deliver them to the appropriate municipal court within 48 hours — the state's deadline for either arraigning or releasing criminal suspects.

Inskeep says he solved that problem by installing Data Processing Design, Inc.'s Word-11 word processing system, which prompts the user for specific information and then prints out a completed complaint.

"We were able to minimize the complaint processing time, make more efficient use of our existing personnel, increase the number of complaints we could process, eliminate more than 200 forms once used by our office, make more time available for police patrol and establish a more efficient word processing operation throughout the department," Inskeep said. "The benefits have been substantial."

Size a Factor

Because of the size of the county, the district attorney's office is spread out. With a main office in the city of Riverside, the district attorney's crew is spread through a dozen offices in outlying cities. Distances between offices vary from a few miles to 200 miles, Inskeep said.

The court system matches the size of the county. Superior courts are located in two cities, Riverside and Indio, while nine municipal courts are located in eight cities, two in Riverside and one each in Corona, Perris, Hemet, Indio, Palm Springs, Blythe and Banning, Inskeep said.

"Simply getting the police reports evaluated and the complaint written created tremendous pressures and problems for satellite offices, which have only one attorney assigned to them, especially when that attorney had a heavy case load and numerous court appearances to make," Inskeep said.

Before the new system was installed several years ago, the district attorney's office and the county made the decision to centralize the felony complaint request processing system. The county began investing in a computer system that would store all police reports and allow the district attorney's office in Riverside to get copies for evaluation and for complaint generation.

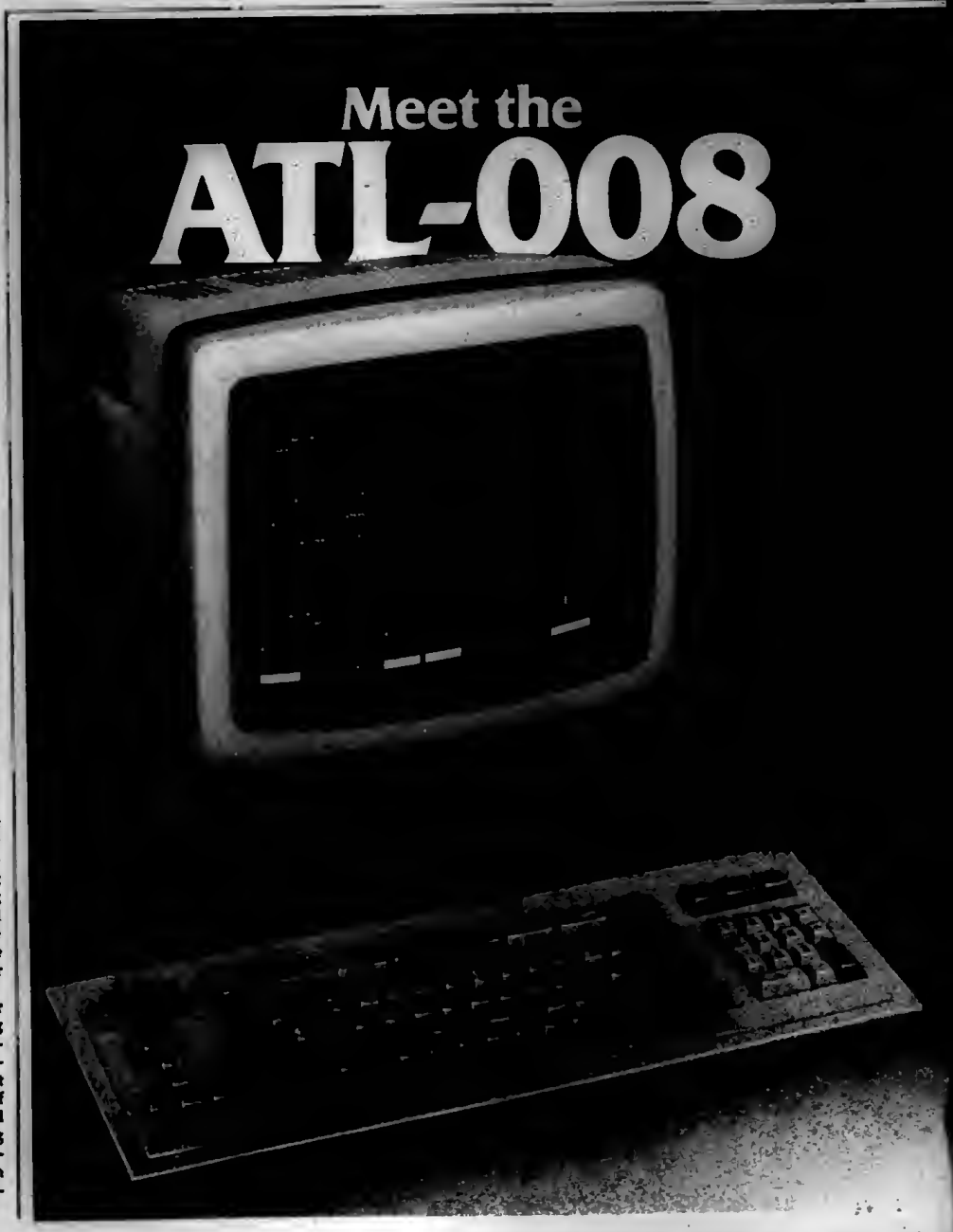
The county issued a request for proposals in 1977, asking responding companies to implement a centralized complaint processing system usable by the district attorney and not requiring the immediate presence of police personnel. The vendor needed to develop complaint processing timetables to assure timely arraignments and to prevent the detention of arrested offenders for periods exceeding the time allowed by statute.

One of the more unique challenges facing the responding companies was that of providing a system that eliminates much of the time spent in the final preparation of a formal complaint document, but allows the document to be printed at the office in which the trial court is located while the person preparing the document is located in another office.

The district attorney's office decided to buy the Word-11 system with enough memory necessary to draw up complaints for the 100 crimes most often charged. The system now contains approximately 800 standard phrases and paragraphs covering about 700 crimes. A forms book was created describing the system's codes for withdrawing the appropriate wording from the computer. The task was simplified because the Penal Code Section numbers could also be used as the Word-11 codes, Inskeep said.

The system was designed not to require technical training of its operators. In Riverside, secretaries and legal stenographers use the equipment on a daily basis, although if necessary, a deputy may draw up a complaint, even if he lacks basic typing skills, Inskeep said.

Additional benefits will come from the completion of a facsimile system, which will eliminate time spent each day driving police reports to the six deputies outside the Riverside office for evaluation and possible action. The complaints will be drawn up at remote offices and transmitted to an office in the city in which the appropriate municipal court is located, Inskeep said.



OCR Expedites Data Entry: Five Case Histories

By John Barthelmy
Special to CW‡

Optical character recognition (OCR) technology can often expedite data entry. The applications that involve computer output microfilm are as varied as the uses for computers themselves. The following case histories illustrate how various system users have incorporated OCR into their systems.

The sexennial reappraisal required by Ohio state law is done by an outside reappraisal company in Stark County — John G. Cleminshaw, Inc. of Hudson, Ohio.

In the past, the property identification, appraisal detail and the building sketches were maintained on card files and kept up to date by manual methods. It became expedient to get this information into the computer record so that the reappraisal could be made more cost-efficient.

One of the major problems was converting the appraisal data and sketches on approximately 180,000 appraisal cards into the computer record. This was accomplished by using an OCR scanner.

The computer printed a scanning sheet for each parcel with the parcel number and property identification. Property appraisal data and a code for creating building sketches from the line printer were handwritten on the scanning sheet by a number of clerks.

The scanner was then used to translate the parcel number and appraisal data to a magnetic tape, and this tape was used to add the data to the firm's computer record. A program had been written to use the sketch codes to draw actual building sketches with the line printer.

An appraisal map sequence was then printed. This was the work sheet the appraisers used to appraise the property. Any changes to the building structure were sketched on the work sheet and any changes or corrections to appraisal data were handwritten on it. Sketch codes were written on the form to reflect the building structure changes, and the forms were scanned to update the computer record.

A third form was then printed by the computer in map sequence and this was used as a final review sheet. Any corrections from this final review were put into the computer record through a CRT and its keyboard.

After the reappraisal figures had been approved by the state Tax Commission, new appraisal cards were printed by the computer, in alphabetical sequence by tax district. These cards are used for reference by the public and are also used as the source for keeping the computer record current.

The scanner permitted a large number of comparatively unskilled workers to convert the appraisal data from the original appraisal cards to the computer record. Scanning the handwritten data from the work sheets eliminated the need to transcribe the updated data to get it into the computer record.

Stark County also handles primary- and general-election registration on an OCR scanner. Those functions were previously performed by four people over an eight- to 12-week period. The job is now handled by one person in less than one week.

Case History No. 2

Customers of Pioneer Federal Savings and Loan, based in Clearwater, Fla., return their mortgage or loan payments in payment envelopes. There are 22 preprinted digits, including a two-digit transaction code, a 10-digit account number and a 10-digit amount due printed on the envelope.

If the enclosed check is written for an amount other than the preprinted amount due, a clerk hand-prints the alternate amount. This alternate amount overrides the preprinted amount on the output tape and is also accumulated into a batch total.

The three single-digit handprint fields A, B and C indicate various exceptions that may apply in crediting an account.

Case History No. 3

Payroll clerks fill out a form for each employee of the Department of General Services in New York City.

Five fields of computer-printed identification information are scanned and several edits are performed on these fields. If the void box is 'X'ed, the document is rejected.

Three lines of numeric handprinted data are scanned to determine exceptions to the 40-hour work week.

Case History No. 4

Manufacturers Hanover Trust Co., based in New York, scans proxy cards for a great number of its bank customers. On the top line of the card, three fields are scanned. The first field is a four-digit company code. If a proxy is accidentally insert-

(Continued on SR/14)

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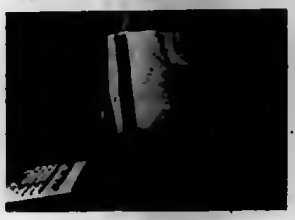

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Dutch Bank Turns to Customers for Input

AMSTERDAM, The Netherlands — A leading Dutch bank here has turned its customers into data entry personnel. The result has been decreased costs and fewer errors.

The Amsterdam-Rotterdam Bank is using five Sperry Univac V77 series minicomputers to man its telephone bill payment service for its customers. Now customers can usually pay all their bills in less than 30 minutes, according to Evert Groot, the bank's programming manager.

The service uses two V77-800 systems, which are located in the bank's central office in Amsterdam. The V77-800 processors receive all customer requests for payment from various bank branches. The requests are then processed and passed on to receiving banks via three Univac V77-200 processors, Groot said.

Currently, the bank's branches send standardized telex messages to the central office on behalf of customers wishing to make various payments. The centrally located minicomputers then produce all the documents necessary for funds transfers. The processors also send a message to the recipient's bank that a payment has been made along with a set of transfer instructions for the receiving bank, Groot explained.

'Before installing the system it was necessary to employ extra employees during peak hours to punch paper tape and to transfer documents . . . After installing the system and basically letting the customers do the inputting, the bank has been able to cut back on the prime-time employees.'

Last spring, the system was expanded to provide a direct access to the bank's mainframe processors in suburban Amsterdam. Now when orders are received the V77-800 minicomputers can poll the bank's mainframe data base to find out in which office the account is based.

In addition, the V77-800 produces a daily summary statement of the transactions with different banks. The system also keeps a chronological log of transactions, Groot said.

Before installing the system, Groot noted, it was necessary to employ extra employees during peak hours to punch paper tape to transfer documents. Since each of the branch banks had different formats for the data, and since the volume of work was high, there were many errors.

After installing the system, and basically letting the customers do the inputting, the bank has been able to cut back on the extra prime-time employees. The error rate has also been reduced, Groot explained.

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OCR Speeds Up Data Entry

(Continued from SR/13)

ed with the wrong batch, the scanner will reject the card.

The second field is a 10-digit account number. A check is performed on that account number to ensure accurate reading. If a character is unrecognized by the scanner, the operator may key in the unrecognized character through the keyboard. If the operator keys in the wrong character, the document will reject because the account number field will fail the modulus check.

The third preprinted field scanned is the number of shares. These shares may be accumulated into a batch total. Votes are read as mark sense fields. If a "for" vote is 'X'ed, a Y is output to tape; an N is output for an "against" vote; an A indicates "abstain"; and a U is output for an "unmarked" vote. If more than one vote is marked per issue, the document is rejected and processed elsewhere.

Case History No. 5

Milgram Foods Stores, Inc., based in Kansas City, Mo., uses an OCR form for the companies that deliver various products to its stores. A 9-digit invoice number is scanned on line one. A check is performed on that number, as well as a validity check on the first three digits of that number, to ensure that proper sequencing and accurate reading occurs.

The date of delivery is hand-printed on line two. This hand-printed date is checked by the editor, making sure that it does not exceed the current date. The charge and credit fields are scanned to determine the number of packages or cases of an item either delivered or returned. This form will reject early if a blank line is encountered so that time is not wasted scanning blank lines.

Barthelmy is vice-president, marketing, at Optical Business Machines, Inc., an OCR firm based in Melbourne, Fla.

Automated System Replaces Manual Means

Company Licks Label Production Backlog

KALAMAZOO, Mich. — The Fine Chemicals Division of Upjohn Co. here was falling behind in production because it took too long to prepare manually the labels for drums of chemicals.

The firm finally decided to install a label preparation system. With the system, the firm can create label formats and print labels in desired quantities when needed.

Developed by Standard Register Co. and based on an Ontel Corp. processor, the unit reportedly saves the firm about $39,000 a year in clerical and paper costs.

The system incorporates a CRT terminal, a dual flexible diskette drive unit and a 300 line/min matrix printer. A software package allows Upjohn to program the system to meet labeling needs, and in the pharmaceutical field, the labeling operation is one that demands and gets high priority, according to Matthew J. Adamcyzk, a systems specialist at Upjohn.

Upjohn is a worldwide research manufacturer and marketer of pharmaceuticals, health services, chemicals, seeds and agricultural specialties.

The Fine Chemicals Division produces a variety of chemical compounds and ships them to producing plants, other pharmaceutical companies and a variety of users of such chemicals. Because they are shipped all over the world in fiber drums and containers, approximately 300 different labels are used.

Cut-Sheet Form

Labels are produced in cut-sheet form, in several sizes, by an in-house print shop.

In addition to the Upjohn logo identification, the labels include other constant information, such as the chemical's name, cautionary information and the producing plant identification.

Before installing the labeling system, a typist had to add net weight, lot number, expiration date and any information required by the customer, such as a purchase-order number. This variable

(Continued on SR/18)

An employee at Upjohn Co. looks at labels produced in cut-sheet form.

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Firm Expands System, Solves Data Entry Woes

PHOENIX — When O.R. Systems, Inc. ran out of I/O ports on its small business system, it knew it had a data entry problem.

Initially established as the data processing department for the western region of Title Insurance Company of Minnesota (Ticom), the group began its automation program with 16 Phoenix offices feeding into a Burroughs Corp. B800 processor.

Branch workstations consisted of Xerox Diablo 1640 printers running on individual dedicated lines. With data processing requirements primarily focused on number crunching, information retrieval and document preparation, the network proved an early success. Users liked the data entry approach, productivity showed an increase and document errors declined.

Subsequently, as the organization took on the look and function of a full-blown service bureau, department resources were upgraded to a Burroughs B4700, and plans were formulated for network expansion via additional Phoenix branches and 14 Tucson, Ariz., workstations.

(Continued on SR/20)

Firm Installs Label System, Licks Production Backlog

(Continued from SR/15)

data had to be added manually to all labels, up to 200, required for a shipment, Adamcyzk said.

Upjohn used to maintain a supply of each label in two large cabinets, each having 192 drawers. Because the information was constantly changing, orders for labels seldom called for more than 200 or 250 per batch. That meant a high per-label cost.

If the company ran out of a label, it took two to three weeks to resupply. Although the firm monitored the inventories closely, it still had problems with obsolescence, which added to costs.

Preparing labels for a shipment was a tremendous ordeal for a typist. It was once only a part-time job, occupying only two or three hours of one person's day, but as volume grew and the size and nature of orders changed, the job became full time and threatened to require an additional person to help meet the demand.

It was a time-consuming operation — inserting a label in the machine, typing the information, removing the label and then starting all over again. It was also repetitious, leading to another type of error hazard. An increase in efficiency was obviously required, and in 1978, Upjohn started to investigate the possibilities, according to Adamcyzk.

Upjohn installed the Standard Register label preparation system (LPS) on Jan. 26, 1981 and the operator was preparing labels the next day.

By the end of February, labels for most of the firm's products were being prepared by LPS and the operator was increasing speed and efficiency. A large order for labels, in the 200 range, used to take half a day to prepare; today that can be done in 10 to 15 minutes. This kind of speed means an actual savings of about $12,000/year in operator time, Adamcyzk noted.

Now Upjohn uses pressure-sensitive labels mounted two-wide on a continuous carrier sheet. There is only one label size, but the firm differentiates among product types by using three colors. The average cost of a label now is about nine cents, as compared with about $1 before LPS.

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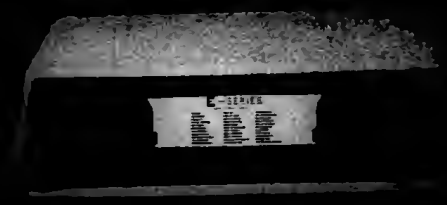

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Competition Lowers Technology's Cost

Third-Party Microfilmer Finds Niche in Fiche

INGLEWOOD, Calif. — Not every company using microfilm has in-house microfilm units. Many companies rely on a third party to produce microfilm records. One such third-party company is Raycom Micrographics, Inc., located here.

Raycom uses NCR Corp. microfilm to serve a variety of customers in the Los Angeles area, according to co-owner of the firm, Ron Griffeth.

"Five years ago, on a national average, it cost about five dollars for an original microfiche and 40 cents for a duplicate. Now these costs are down to two dollars and 20 cents, respectively," Griffeth said.

"Here in Los Angeles, the costs are even lower — $1.50 for an original and 15 cents for a duplicate — due to competition.

"The major reason for the overall reduction in prices is that the equipment manufacturers have long since recovered their research and development investments, so the hardware is less expensive than it was when the industry was younger," Griffeth said.

One-part computer paper costs $33 per thousand pages. That's 3.3 cent/page just for the raw materials. To that must be added the costs for the actual printing, collating, decollating and distribution, Griffeth noted.

But Raycom, using a 48-times reduction, can put 269 computer pages on a single 4-in. by 6-in. microfiche. That means their customers pay six mil/page for an original reproduction with one duplicate. Using Griffeth's figures for other locations in the nation, that cost would be about 8 mils per page.

Customers generate a magnetic tape in print format from their computers. The Raycom package includes everything else, including pickup of the tapes and delivery of the fiche and duplicates, which Griffeth said average five duplicates per original.

Off-line, laser-generated printing in an 8½-in. by 11-in. format can also be done from computer tapes, Griffeth said.

Raycom computer output microfilm (COM) users include aerospace firms, department stores, hospitals, insurance companies, financial institutions, manufacturers, supermarkets and others.

Turnaround time, in addition to rigid quality control, is perhaps Raycom's major strength, its co-owner claimed. Overnight production is routine, he said, adding that for some customers with special needs, the company can turn jobs around in only four hours and as often as four times a day.

"One of our four-times-a-day customers is a brokerage service, and its work load is anything but light," Griffeth said. "Their reports frequently run to 10,000 pages.

"We recently increased our capacity by purchasing the NCR 5330 system which has its own 128K-byte minicomputer," he said. "This uses a wet process for silver-halide film which meets the archival standards of both the National Microfilm Association and the American National Standards Institute. Yet the NCR approach does not require a darkroom. Everything is done in a continuous stream inside the processor. Dry-silver films cannot match the quality," Griffeth said.

"The big advantage of the system is its speed in delivering cut fiche. The first fiche is produced three minutes after the start button is pushed. The subsequent originals are delivered to the user at one minute intervals after that.

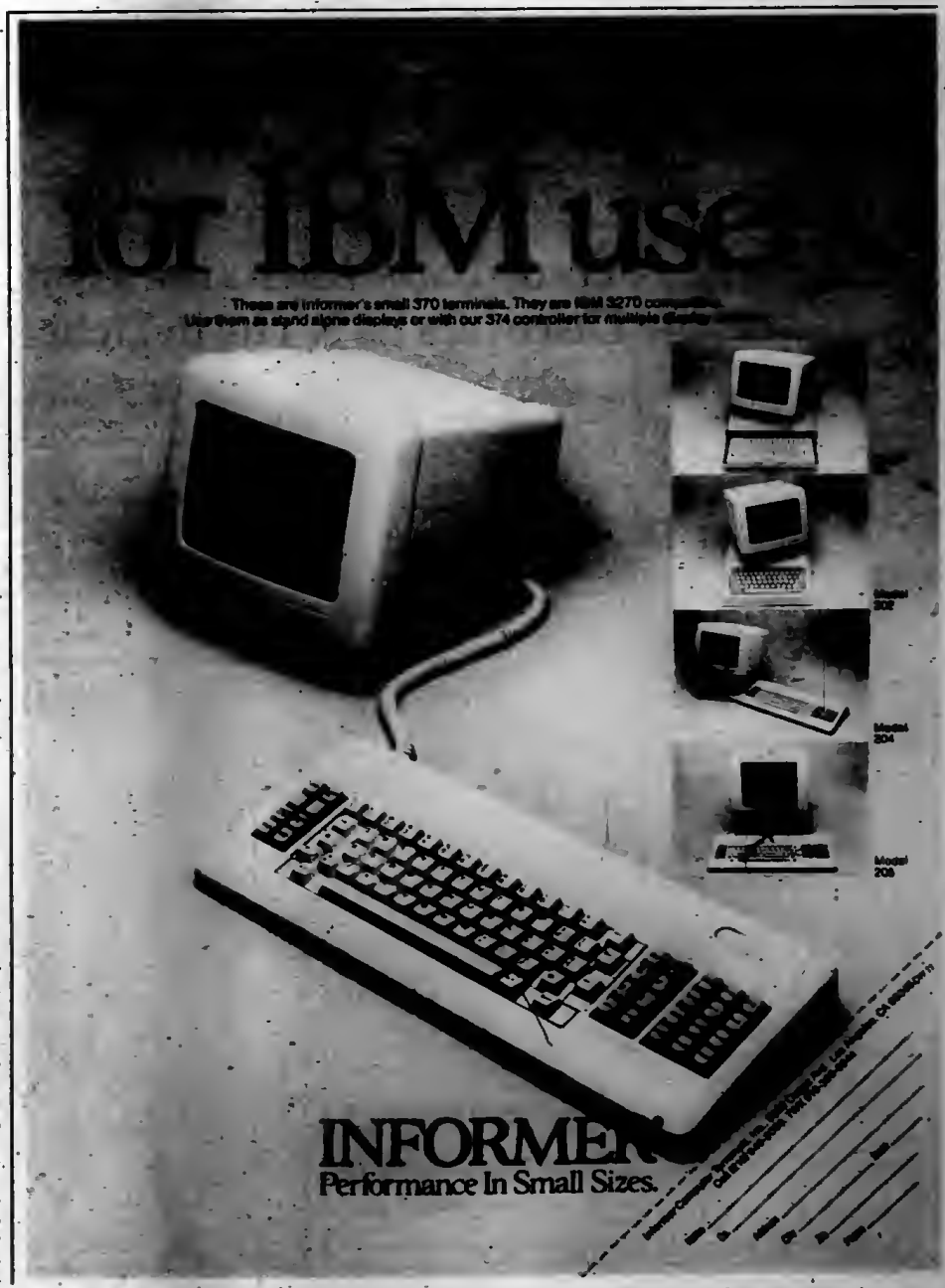
"A few of our competitors in town have some cut-fiche capacity, but for the most part their equipment uses whole rolls of film, which require darkroom processing. That means it takes them two to four hours to turn out what we can achieve in a fraction of that time," Griffeth said.

The 5330 system also eliminates the bore-sighting that is usually required to align the glass format slides with precision. Furthermore, Griffeth noted, the 5330 automatically prevents the half-character drifting on the x and y axes that can occur on other processors. This is extremely important when a forms overlay is required by the customer.

"The operating software, NCR's Micrographic System Executive, makes it easy to set up job parameters which are then stored in magnetic disk memory," Griffeth continued. "The software also displays operator prompts on the CRT screen, which simplifies things even more."

For Raycom, it does not matter what kind of computer a customer

(Continued on SR/20).



Hospital Heals Information Ills With System

MIAMI — A computer-aided patient care system utilizing a voice intelligent terminal has been developed by a medical center located here.

The patient care system, developed by Mount Sinai Medical Center, uses voice recognition to solve the many problems of information handling that exist in health care institutions, according to Bruce Kosens, director of systems at the center.

The menu-driven system uses a small voice input vocabulary to order any one of its more than 10,000 services for any patient in the hospital. Patient and administrative privacy is maintained by restricting access to information only to approved terminals and then only to approved individuals, Kosens explained.

In providing patient care, the most important concern is that the appropriate patient receives the service ordered at the time requested, without error. The Mount Sinai Voice Recognition Patient Care Control System helps reduce the human-error factor, Kosens explained.

The system moves requests for services and supplies between departments rapidly and accurately, according to Kosens. It also performs the following functions:

- Edits and verifies orders before releasing them.
- Prevents accidental duplication of orders.
- Continuously and automatically "reminds" departments of orders

(Continued on SR/22)

Adding Terminals Solves Company's Woes

(Continued from SR/18)

recalled Ed Schwebel, the firm's manager of research and development.

In February 1981, barely 18 months after initial organization, the department was launched as O.R. Systems (ORS), a wholly owned Ticom subsidiary. Joint venture partnerships and sister companies of Ticom began entering the ORS network. In northern California, Title added another 100 workstations to the network. Working with Pacnet Communications of Oakland, Calif., ORS established two 56K-byte communications lines to blanket the entire California network leg, Schwebel said.

As part of the network upgrading, a Burroughs B6800 processor was added and the original B800 and a new Burroughs CP9500 were drafted for concentrator duty. For expanding operations into account servicing, remote order desk requests and general ledger accounts, ORS programmers rapidly developed new applications software. Document preparation functions were enhanced through the addition of simple word processing capabilities, Schwebel said.

Workstations using CRT terminals employing a Burroughs Poll/Select protocol with a transparent and separately addressable printer port were advocated and a lengthy period of equipment evaluation began. Because the company's six Burroughs' TD830s, used in the central office primarily for programming tasks, did not incorporate a transparent printer port enabling the system to address the workstation terminal and printer as totally separate terminals, the firm decided the terminals were inadequate for workstation application, Schwebel said.

According to Schwebel, the essential requirement was to return much of the work load back to the workstation. "What we needed was a Burroughs-compatible intelligent terminal, one that could be easily upgraded to a stand-alone microcomputer without sacrificing any of the unit's lower level features. Modular design was important, as were delivery and price," Schwebel said.

"Further, we had to be assured of adequate network security and back-up, proper vendor support and ease of maintenance," he added. "The equipment would have to be designed for effective integration into existing equipment configurations and into future applications under development."

Third-Party Microfilm Firm Discovers Its Niche in Fiche

(Continued from SR/19)

uses. Like other microfilm units, the 5330 will handle tapes from any of the major vendors' drives, in seven and in nine channels and in any density.

High-Speed Camera

The COM unit's high-speed camera, which is microprocessor-controlled, is normally fitted with the 48-times reduction lens because that format is the most popular, according to Griffeth. But for customers who want other reductions, Raycom also has 24-, 42- and 72-times reduction lenses.

In promoting fiche to first-time users, Griffeth said he often encounters initial resistance because the microform cannot be written on, and those users accustomed to computer print-out are concerned aboot being deprived of something upon which they can inscribe notes.

"As it is, I've never had a fiche user abandon it and go back to paper," he noted.

One of the realities of the COM service business, of course, is that customers often install in-house systems when their reproduction volumes make that step cost-effective. Griffeth knows this and accepts it. In fact, instead of trying to deter such decisions, he works with customers as a consultant.

"The justification point for an in-house operation, in terms of either dollars or pages, can vary from one company to another," Griffeth commented.

"Factors which have to be considered include the capital investment, turnaround requirements, hardware maintenance, the inevitable downtime problems which will occur when you have only one machine as well as the factors of recruitment and retention of skilled personnel," Griffeth said.

"There are many companies which make voluminous deliveries, but they don't want to get into the trucking business. In the same vein, we have customers who have quite high volumes, 6,000 fiche a month and more, but they prefer to let us handle the work."

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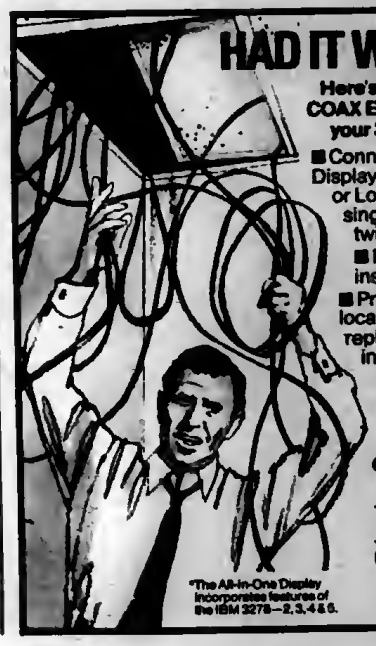

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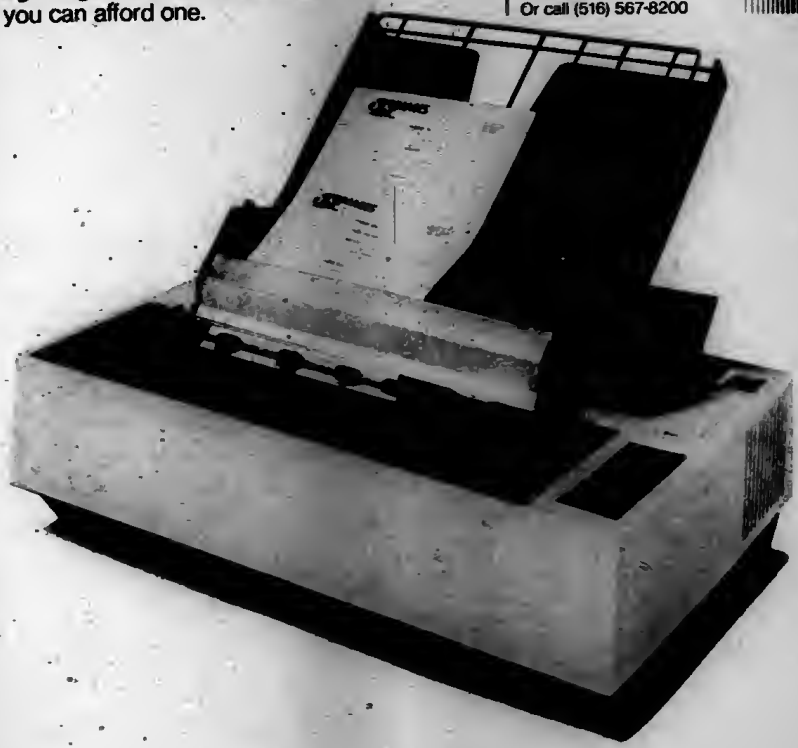

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Hospital Cures Information Ills With System

(Continued from SR/20)

that have not yet been performed.

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- Automatically generates recurring requests.
- Quickly and accurately reviews the status of work requests (by patient, service or physician).
- Sends out multiple messages and orders from a single request.

Those performance characteristics apply to any process the hospital personnel wish to control, from admission to discharge, Kosens explained.

The systems director contends that the voice system provides user-friendliness, enabling users to order directly services and supplies.

The Mount Sinai system uses Burroughs Corp. CRT terminals and printers controlled by a Burroughs B3900 processor system. It also uses voice recognition terminals supplied by Interstate Electronics Corp.

The Interstate VRT101 is programmed by Mount Sinai to communicate with the host by emulating a Burroughs terminal while accepting both voice and keyboard data input. The VRT101 also uses its internal storage to maintain data used for local processing, thereby reducing the host's processing burden, Kosens said. Other users of the voice system have used the Burroughs B2900 processor, he maintained.

Fully Integrated

The VRT101 is a fully integrated voice recognition system. Combining dual Zilog, Inc. Z80 microprocessors and 48K-byte memory with an 80-char. by 25-line display, keyboard, floppy diskette drive and a 100-word Voice Recognition Module (VRM), the VRT101 performs voice recognition without user involvement in voice-related software design or hardware interfaces. Since voice recognition is an integral part of the VRT101, the unit can accept and process input data independently, whether its source is voice or keyboard, according to Kosens.

One of the terminal's Z80 microprocessors services the display and keyboard and the second Z80 serves as a programmable host computer. The host CPU is provided with 48K bytes of random-access memory (RAM) and two serial RS-232C ports for communication to a central host, printer or telecommunications channel. The VRT101 has a built-in floppy disk controller and drive and supports an optional external dual diskette drive, Kosens explained.

Speech input is analyzed by a 16-channel spectrum analyzer and converted to a digital representation of the characteristics of the spoken input. This digital data is then converted to a fixed-size pattern that preserves the information content of the spoken inputs while discarding redundant features. During word training, these patterns are used to derive templates for each vocabulary item. The templates are then used in the recognition process for comparison with incoming spoken words, Kosens explained.

Vocabulary templates are stored in the on-board RAM of the VRM while the processing algorithms are contained in an erasable programmable read-only memory operating in conjunction with the VRM's microprocessor. The voice recognition capability of the VRT101 system is accomplished without the use of the Z80 host processor or its random access memory; therefore, the VRM does not impact the capabilities of the main Z80 host or host system mainframe, Kosens noted.

Voice recognition is accomplished via the VRM and a dual printed circuit board automatic speech recognizer consisting of a microprocessor, 8K bytes of read-only memory, 8K bytes of RAM for reference pattern storage, analog circuitry for speech spectrum analysis and interface electronics, Kosens said.

Two communications paths lead to the VRT101 host processor: maintenance with parallel communications and speech recognition and/or keyboard serial communications. The hardware configuration with the VRM in the recognition mode is transparent to the VRT101 host processor in that data entered either from keyboard or by voice is processed identically, Kosens concluded.

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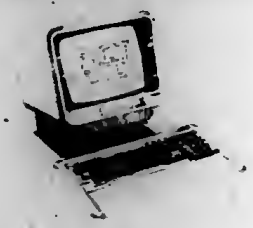

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System Switch Saves Textile Firm $3,000/Mo

NEW YORK — A textile distribution firm here is saving about $3,000 per month by switching from a batch-oriented central processor to an interactive system. Furthermore, the firm's DP manager said the company operates more smoothly now that it no longer relies on keypunch personnel to enter data.

Henry Glass & Co. needed a system that would enable the company to come up with up-to-date data so company management could give its customers accurate delivery and production information.

"When an apparel manufacturer orders goods from us, he wants a firm delivery date. He has to know when he can expect to receive those goods; otherwise his production schedule will be off. And that will cost him money. If he can't get the delivery he wants from one converter, he'a likely to turn to another.

"When we make a commitment, we have to stick to it. This is where DP comes in. Through our computer, we can let the customer know in a matter of moments the exact day we will deliver his order," Serge Melamed, DP manager at Henry Glass, claimed.

Tight Control

Melamed contends that an interactive processor is essential to survive in the textile business. "We always have to be aware of the status of our goods. We also must keep tight control on our purchasing and inventories. Before data processing came along, companies like ours maintained this information on cards, which always left open the possibility of human error. Errors can cost any company money, and they can have a dramatic effect on income," he said.

"An accurate invoice has to be delivered with the order. This enables the customer to check the accuracy of the shipment. On the other hand, we have to maintain up-to-date records of what the goods are costing us. This costing-out has to be done as soon as we get invoices from our mills," Melamed said.

Before installing the Wang Laboratories, Inc. VS system, the firm would have to batch invoices as they came in. The invoices would then be sent to the keypunch department, Melamed said.

Once in the keypunch department, continued Melamed, invoices would often sit around until there was time to key them in. That often took more than a week. With the VS system, invoices can be entered within a few minutes after they arrive.

Management at Henry Glass can see the important figures fairly quickly and the system can be used to verify that the figures presented in the invoices are correct.

Now that the system has been integrated into the daily operations at Henry Glass, the manual card system has been aliminated. Melamed said the firm'a department managers have accepted the Wang processor and are constantly finding new uses for it. Melamed said the processor has made the firm more aware of what DP can do for it and has boosted company morale.

Not only has the system decreased the number of errors, it also has made the information more accessible. For example, Melamed said, data can be entered into the VS processor's editor, changed and a program compiled in about 15 seconds. That process would take about 20 minutes on the firm's older batch system.

So far, the company has invested about $175,000 in the Wang system. The system includes 13 workstations, and Melamed said the firm has plans to install at least two more workstations in the near future.

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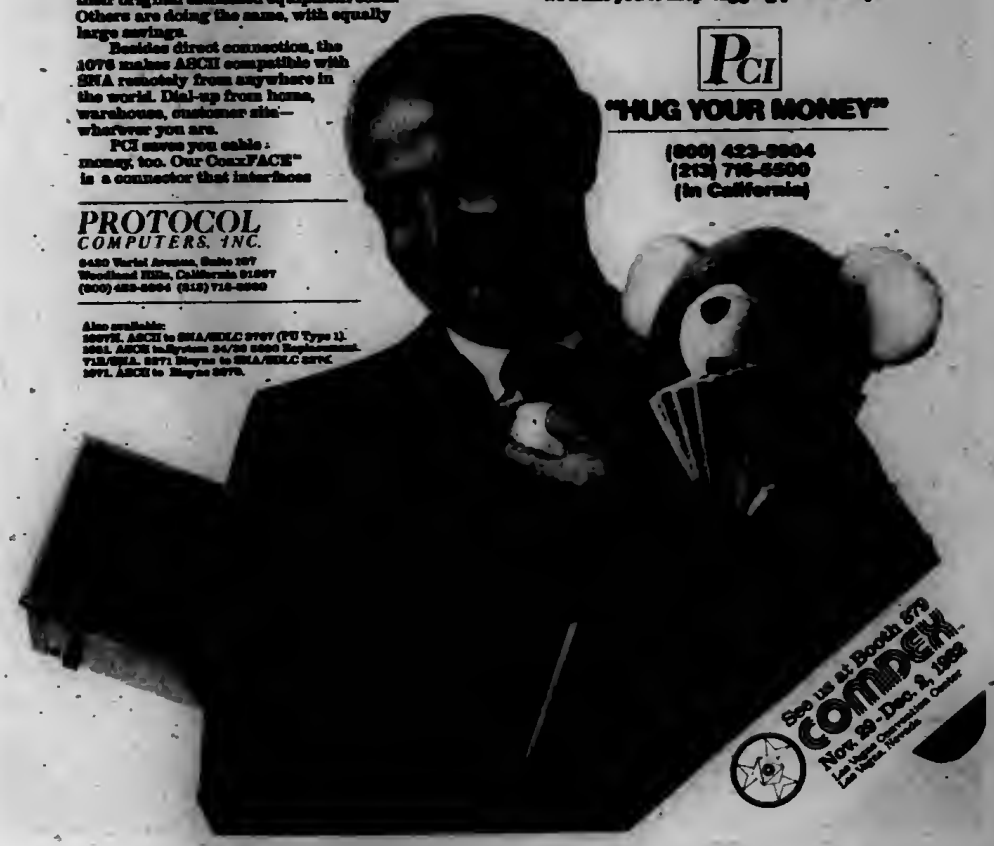

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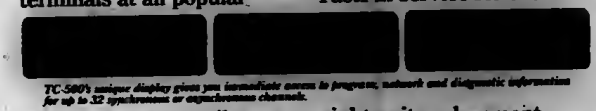

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'There just may be a corporate data base at the end of that rainbow painted by the DBMS vendors and the textbook purists.'

Data Base Dreams Return to Earth

By Bill Marel
Special to CW‡

Is there a "corporate data base" at the end of the rainbow, and is this even a realizable and worthwhile goal?

The purist practioners of data base would have us believe so. Their textbooks conjure up rosy images of a wholly integrated data base with very tight logical links and minimal data redundancy built on a foundation of a stable model of the corporation.

However, if we take a somewhat more earthy view of the situation, we can replace some of these wispy images with more concrete and useful perspectives.

If data base management system (DBMS) packages do not foster corporate data bases, what are they used for?

I have observed that these packages are most often used as sophisticated access methods to support specific applications systems. In some cases, the data base supporting these systems have weak logical links between them, but often they are distinct with no logical connections.

The demise of the corporate data base probably involves a combination of the following factors:

• Corporations are in business to make a profit. Consequently, a corporation cannot afford to lie still on an operating table for a year or two while a team of systems analysts from management information systems (MIS) dissect it.

• The effort of analyzing, designing and programming tends to be application-oriented in an MIS department.

This perspective is not conducive to the construction of a corporate data base since the data base administrator has to function in a service mode to produce data base designs to support these single application projects. The data base administrator often has to work within the time slot shown on the project schedule as "Data Base Design," which often shrinks if the system design phase is behind schedule.

These factors tend to sweep the administrator along as part of the project team, allowing little time for the integration of a design with existing systems. They also relegate the data base administrator to a back-end role where there is seldom any opportunity for significant feedback into the application design process.

• Software development costs are rising rapidly and many MIS departments have assumed the role of applications package supporters.

MIS management should insist that any purchased application software use the DBMS that it paid good money for.

Their intentions are honorable, but this feeble effort at ensuring compatibility may not bear fruit for several reasons.

If your vendor lacks expertise with your DBMS then the version offered to you will most likely run very inefficiently. Any effort by your data base administrator to modify the vendor-sup-

(Continued on Page 58)

Conversion Service For DOS to MVS To Be Made Available

DETROIT — Peat, Marwick, Mitchell & Co. will be making available the IBM DOS-to-MVS conversion service that it has been offering only on request to its current client base.

Users have three alternatives. They can acquire:

• The full service, which includes the use of the Peat, Marwick-developed MVS Operating and Technical Standards and Procedures methodology and Peat, Marwick's JCL converter and Cobol source code conversion software.

• Various segments of the service.

• Consultation during a conversion and training that will enable them to use the methodology and the software themselves.

The first stage of the service is assistance in conversion planning, which is designed to help the user identify and establish the installation's direction and policies. It reportedly takes about two to three weeks to put together a conversion work plan, with Peat, Marwick consultants working with client representatives and will cost the client approximately $10,000.

The tailoring of the Peat, Marwick MVS Operating and Technical Standards and Procedures manual to meet a specific installation's needs involves a walk-through of the manual with the installation staff, consultation with Peat, Marwick staff to update jointly the manual with the client's specific requirements, including work flow and development of a draft manual for the user. Peat, Marwick also provides an instruction program to educate

(Continued on Page 59)

System Control Program Works With VM/SP, VM/370

RIDGEFIELD, Conn. — Adesse Corp. has unveiled a system control program that it said works in conjunction with the IBM VM/SP and VM/370 Release 6 operating systems to manage the resources of IBM and plug-compatible mainframes and provide multiple users with virtual machine facilities.

The Single System Image (SSI) software is said to provide a virtual machine environment to multiple hardware systems that is transparent to most system users. SSI is a collection of enhancements to the VM/SP control program that alters its mode of operation on multiple-processor configurations, the vendor said.

The vendor said additional processors can be added to an SSI complex with minimal disruption of users, and processors can be removed from service without significant effect. The software is intended to reduce the impact of unscheduled system outages and to balance the loads imposed on various processors.

The monthly charge per SSI complex is $4,500, including maintenance. The purchase price for SSI is $100,000 per SSI complex. The monthly maintenance charge for a purchased license for an SSI complex is $500.

Adesse can be reached at P.O. Box 515, Ridgefield, Conn. 06877.

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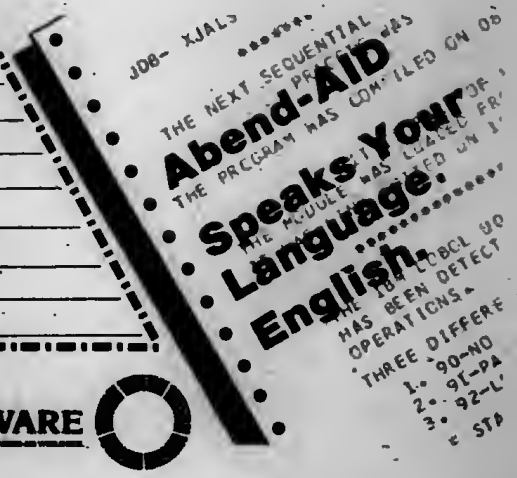

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COMPUWARE

Corporate Data Base Dreams Fall Back to Earth

(Continued from Page 57)

plied data base design or integrate it with whatever other data bases you have probably will void your warranty with the vendor.

If you have other packages installed from other vendors, then the chances for any integration of the underlying data bases are negligible!

A viable alternative has surfaced recently in the area of purchased applications software. Some DBMS vendors are offering applications packages that claim to be modular and also readily integratable if you buy several of them.

If your budget can withstand going with one vendor and the associated uncompetitive prices, then this approach probably comes closest to the lofty corporate data base that we are seeking.

Before jumping aboard this bandwagon, there are some other factors to be considered, namely how well these packages will flex to support changes in corporate direction and the converse question: What changes in your current business operations are required to ensure a clean mesh with the applications system?

• There is a subtle hidden fear at work in many MIS departments.

This fear is manifested in the notion that if we do things right and have well-designed, integrated data bases, then we increase our chances of becoming redundant. This notion probably can thrive in those shops that continually are fighting fires.

The MIS staffers perceive data base technology as a threat to their livelihood. This naive attitude ignores the fact of corporate evolution. No matter how large and immobile a corporation may appear, it will change with time, and no supersystem can halt or avoid that change.

• High-level corporate perceptions of the DBMS as a tool purchased to aid the MIS department can thwart any attempt to assemble a corporate data base.

The impact of a DBMS on a corporation will be directly proportional to the expectations of upper level management, provided it creates an environment for the data base administrator that is fertile for those expectations.

Stumbling Stage

In many human endeavors, we learn to crawl before we walk, and even after we are walking, we stumble occasionally. Many DBMS users are experiencing the growth stages of crawling, walking and stumbling with their efforts at effectively using data base management systems.

As attainable goals we should strive for well-designed data bases that support applications systems without overly stressing integration and the gradual elevation of the role of the data base administrator in the corporate framework without rocking the boat.

These objectives should result in all applications within a corporation running reasonably efficiently under one DBMS and the data base administrator being in a position, preferably outside MIS, to do some serious data modeling and integration.

There just may be a corporate data base at the end of that rainbow painted by the DBMS vendors and the textbook purists.

Marel is president of Marel, Inc., a Seattle-based consulting firm specializing in DBMS support.

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'Finanswer+' Version Out For IBM's TSO Under MVS

TULSA, Okla. — Datamate Co., Inc. has announced a version of its Finanswer+ spreadsheet program for IBM and plug-compatible mainframes running TSO under IBM's MVS operating system.

Written in Cobol, the package is designed to use IBM's 3270-style CRT terminal as if it were a personal computer terminal. The package allows financial analysts to do budgeting and modeling interactively, the vendor said.

The package supports 12 spreadsheet/data file with a maximum of 2,400 figure/spreadsheet. Spreadsheets can be linked or consolidated for a total of up to 28,800 figures, the vendor said.

The package costs $2,995. Similar versions of the package have already been announced for other vendors' systems. The firm is located at Suite 101, 4135 S. 100th East Ave., Tulsa, Okla. 74145.

Tool Unveiled For IBM Series/1

DALLAS. — Data Index, Inc. has announced its Proc/Mach 1 package for the IBM Series/1 minicomputer running under the EDX operating system.

Proc/Mach 1 is a procedure processor that reportedly answers conversational questions for a sequence of programs without operator intervention, according to the vendor. It is parameter-driven, enabling the operator to vary and date similar information before freeing the processor to produce lengthy batch reports, the vendor said.

This product reportedly repeats any conversational procedure that is executed once by an operator because the system will store that procedure for repetitive operations, the vendor explained. It also has the power to audit the repeated process, making sure the right tape is mounted, the correct diskette is available or that the printer is active.

Proc/Mach 1 can reduce programming efforts in development environments, the vendor said. It can sequentially execute standard IBM utilities including $Diskut, $Dasdi and $Initdsk for redundant programmer chores.

The software costs $850 and is available from Data Index at 4390 Alpha Road, Dallas, Texas 75234.

DOS Conversion To MVS Offered

(Continued from Page 57)

the client's staff in the installation's newly acquired standards and procedures. This phase of the conversion service takes between six to eight weeks and involves consulting fees of between $20,000 and $30,000, the vendor explained.

The Peat, Marwick JCL Conversion Program uses tables, certain DOS JCL parameters and DOS synchronous line interfaces to prepare certain JCL parameters, the vendor noted. TSO or other library management software reportedly is utilized to complete the JCL. This is available for between $10,000 and $15,000, depending on tailoring requirements. The vendor's DOS Cobol-to-MVS Cobol Source Code Convertor is available for between $10,000 and $15,000, depending on the needs of the installation. Both software packages include training and documentation.

Further information about the DOS-to-MVS conversion service and its various components can be obtained by contacting Peat, Marwick, Mitchell & Co. at 3400-200 Renaissance Center, Detroit, Mich. 48243.

Capacity Management Tool Bows For IBM VM Supporting CMS

WALTHAM, Mass. — BGS Systems, Inc. has unveiled Best/1-VM, the first of a family of capacity management products for IBM VM/370 systems.

The software is intended to run on IBM VM systems that support CMS. Best/1-VM reportedly utilizes Virtual Memory Array Processing data analysis reports and guest System Control Program (SCP) measurement data to show performance of key work loads such as CMS interactive, CMS batch and guest SCPs under measured operating conditions.

Like its MVS counterpart, Best/1-VM is an interactive modeling tool designed for use in capacity planning, performance tuning and system design. Capacity planners and system programmers can use the software to assess the impact of proposed changes such as increasing the number of CMS terminals; adding or deleting guest SCP work loads such as DOS, VS1 or MVS; CPU upgrades; or direct-access storage device configuration changes.

Best/1-VM is priced at $22,500 for a single-site perpetual license. Multisite discounts also are available, the vendor said from 1 University Office Park, Waltham, Mass. 02254.

On-Line, Interactive Package

Accounting, Sales Tools Out for System/34

CONCORD, Calif. — Johnston, Brown & Associates, Inc. (JBA) has announced accounting software for the IBM System/34 and a sales analysis and control system for both the System/34 and the System/38.

The JBA Accounting System reportedly provides management with an on-line, interactive financial software package consisting of general ledger, accounts payable, accounts receivable and user-defined financial statements and management reporting. Each module is said to include documentation from implementation manuals and work sheets to user manuals, as well as first-year maintenance.

Special features include the ability to print any financial statement at any time, on-line inquiries (summary or detail) on any general ledger account or accounts payable vendor, multiple trade accounts partial payments and multicompany/division capabilities, the vendor said, noting that each module is menu-driven.

All three modules are available for $7,500. Accounts payable and general ledger are available for $6,000. General ledger alone is priced at $4,000, and accounts payable alone is priced at $2,500.

The Sales Analysis and Control System (Sacs) includes details of customers' historical purchases by item, territory, region and division, with comparisons to plan and two years of history, the vendor explained. In addition, it includes reporting on specific problem areas by product, customer and sales representatives; and analysis of product group, industry class and profitability. Sacs is said to interface to order entry and JBA's Forecasting Systems.

The System/34 version of Sacs is priced at $8,000. The System/38 version is available for $14,000. The vendor is located at 1465 Enea Circle, Building E, Concord, Calif. 94520.

'Calc/34' Version Fits System/34

WINTER PARK, Fla. — Westmoreland Systems, Inc. has announced Version 3 of its Calc/34 financial modeler for the IBM System/34.

Calc/34 generates spreadsheet projections and examines "what-if" situations. Version 3 is said to feature such built-in functions as depreciation, amortization and internal rate of return.

Other features include flexible logic and calculation capabilities, fast model execution, consolidation and user-file access, the vendor said.

Calc/34 Version 3 costs $2,000. A 30-day trial with an operator training course costs $100 from Westmoreland, Suite I, 228 Park Ave. N., P.O. Box 2726, Winter Park, Fla. 32789.

Trisys Adds 'Vtoc' to Tools For System/38

SHREWSBURY, Mass. — Trisys, Inc. has announced the addition of Object Directory Analysis and Volume Table of Contents (Vtoc) software to its series of IBM System/38 conversion and operation tools.

These integrated tools are designed to provide insight into the object-oriented architecture of the System/38 and the logical and physical files of any library, the vendor said. The Object Directory Analysis reportedly provides five types of report: general, ownership, save/restore, exception and source member/execution object conciliation. It is priced at $875.

Vtoc reportedly provides a description of both physical and logical files, which includes file type, file location, record counts, file creation dates and both member lists and counts with member creation dates, according to the vendor. It costs $225.

Trisys can be reached through P.O. Box 274, Shrewsbury, Mass. 01545.

'Apas' Programs Targets FPS

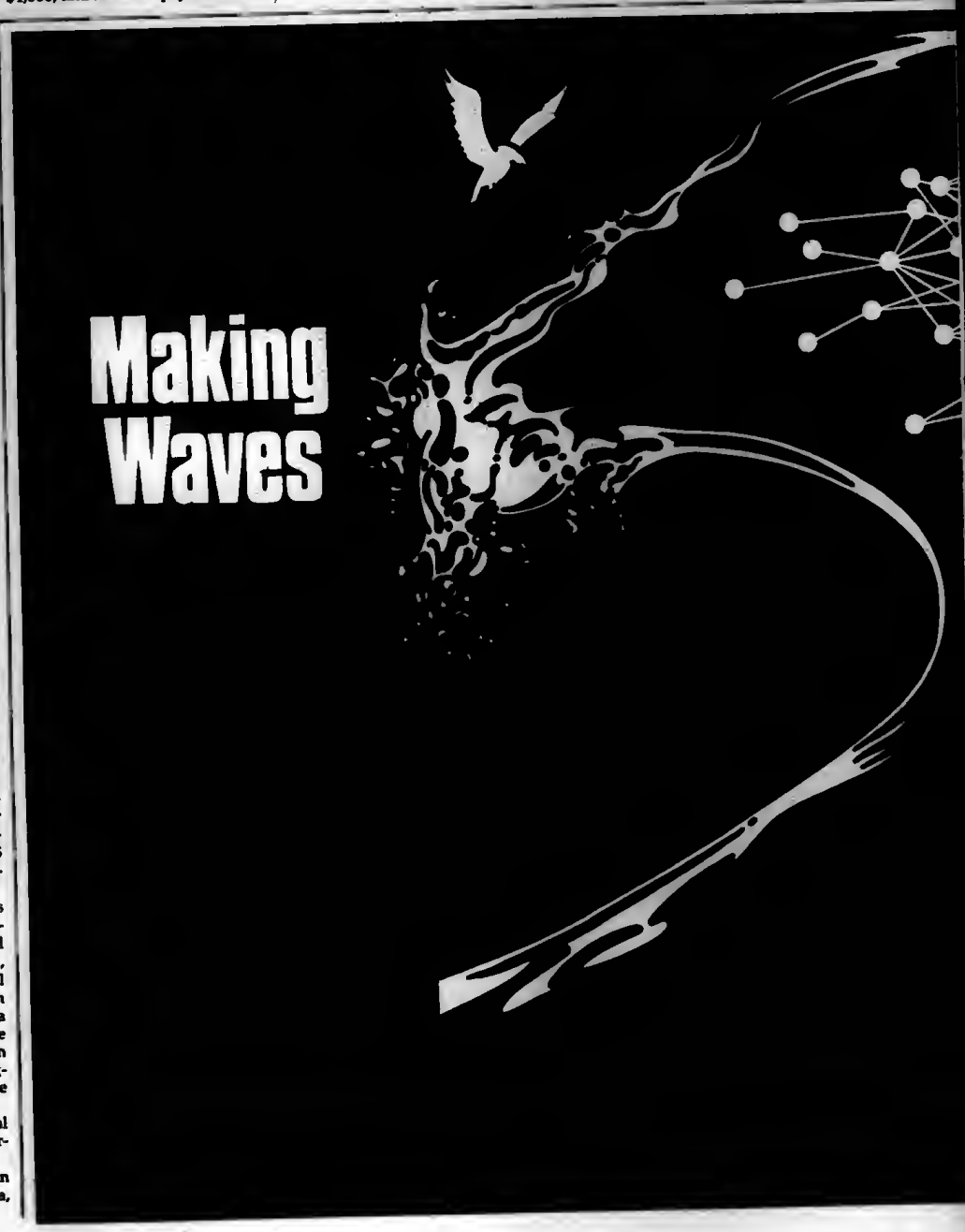
GOLETA, Calif. — Signal Technology, Inc. has announced a set of interactive Fortran programs that reportedly allow users of Floating Point Systems, Inc. (FPS) array processors to use that hardware without initial software development.

The package, designated Apas, operates on either the FPS AP-120B or the FPS-100 array processors on Digital Equipment Corp. VAX-11/VMS or PDP-11/RSX-11M computers, according to the vendor.

The programs include graphics support and are used for signal processing applications such as digital filtering, spectral density estimation, autoregressive analysis, spectral analysis and spectral analysis with three-dimensional displays, a spokesman said. Apas programs use the Fortran-callable subroutines in the advanced math libraries and signal processing library from FPS, the vendor said.

Apas is an add-on option to Signal Technology's ILS package for interactive signal processing.

Apas costs $4,000, the spokesman said from 5951 Encina Road, Goleta, Calif. 93117.



Decision Support System Designed for System/34

CINCINNATI — Personal Software Publications has announced a decision-support system designed for the IBM System/34. Called the Percentage Comparison Table, the software is said to generate the most commonly used comparison reports without the need for program development.

According to its vendor, potential applications of the Percentage Comparison Table software include:

- The monitoring of actual vs. budgeted expenditures by accounting departments.
- The tracking of comparative achievement of products, advertising media and sales personnel by marketing.
- The tracking of rejects, warranty claims or product returns by categories by manufacturing.

The Percentage Comparison Table software is distributed on a diskette in machine-readable form and includes documentation. The first-year licensing agreement is $785 and is renewable for a $150 maintenance fee. Maintenance includes telephone consulting, product support and enhancements.

A money-back guarantee is offered during the first 30 days after the purchase of the product, the vendor said from 10857 Reading Road, Cincinnati, Ohio 45241.

System/38 Users Get Batch Tool

DEDHAM, Mass. — General Information Systems Corp. has announced an interactive/batch program and a gift recording and alumni-development records system for IBM System/38 users.

Decimal/38 automatically reviews specified zoned or packed numeric fields and reports or updates problem fields based on user instruction. It is priced at $295.

Grads/38 is an interactive, user-driven system written in RPG-III that helps schools keep track of donations. It costs $35,000.

General Information Systems can be reached at P.O. Box 1295, Dedham, Mass. 02026.

Inventory Aid Fits System/38

HAMILTON, Ontario — Shaw Computer Consulting Services, Ltd. has announced System/38 Stores, a stores inventory and purchasing management package for IBM's System/38.

The package supports both Stores purchasing orders and non-Stores purchasing orders. This, the vendor said, allows a purchasing department to generate all purchasing orders with the package. The package can be used with the firm's accounts receivable package for the System/38.

The System/38 Stores package costs $37,000 (Canadian) for a one-time license fee. The accounts payable package costs $12,000 (Canadian) and both packages are available for $45,000 (Canadian).

The vendor is located at 225 Main St. W., Hamilton, Ont. L8P 1J4.

Three Modules Added to 'Gbacs'

NORTH ATTLEBORO, Mass. — RTC Systems, Inc. has added three modules to its General Business Applications Control Systems software, which runs on IBM System/38 computers.

The new programs, designed in RPG-III, are the Personnel Management system, an equipment and vehicle maintenance system and a Material Requirement Planning (MRP) package.

The Personnel Management system costs $6,000; the equipment and vehicle system is priced at $7,500; and the MRP package is base-priced at $7,500, according to an RTC spokesman. Further details are available from TRC at 55 Plain St., North Attleboro, Mass. 02760.

Micro Notes

Persyst, Inc. has introduced a software print spooler for the IBM Personal Computer called **Wait-Less**. It supports both parallel and serial printers and user-selectable buffer sizes from 2K bytes to 62K bytes. It is available for $49.95 from the vendor at Suite 210, 5300 Orange Ave., Cypress, Calif. 90630.

Ellis Computing has reduced the price of its software, which is compatible with the Digital Research, Inc. operating system, CP/M. The packages, **Nevada Cobol, Nevada Fortran, Nevada Pilot** and **Nevada Edit**, have all been reduced to $29.95 each. More information is available from the vendor at 600 41st Ave., San Francisco, Calif. 94121.

Persoft, Inc. has introduced the **TE100** software package, which is said to allow the IBM Personal Computer to emulate Digital Equipment Corp. VT100, VT101, VT102 or VT52 terminals. Version 1.0 of this package supports DEC editors that use the numeric pad as special function keys. It is available for $128 from the vendor at 2186 U.S. Highway 51, Stoughton, Wis. 53589.

Magnetic Information Systems (MIS) has announced a **personal-program cassette copy service** geared to the large personal computer user market. The service copies personal programs on MIS digital cassettes at a cost of $5 for a single copy. The service is available through Box 806, 415 Howe Ave., Shelton, Conn. 06484.

Version of 'Dart' Out for Compustat Data Base

STAMFORD, Conn. — Real Decisions Corp. is offering a modularized version of its Data Access & Reporting Technique (Dart) for processing information on a Standard & Poor's Computer Services Compustat data base.

Dart now is available in a choice of modules ranging from an entry-level retrieval and reporting tool called Dartpac to a full-service package called Dartmaster, according to a spokesman for the vendor.

Dartmaster adds interactive query, screening and viable format reporting, the vendor spokesman explained.

Both modules reportedly will be able to access the Bank, Utility, Telecommunications and Business Information files of the Compustat data base. They will also be able to access the Compustat II industrial group of 6,000 companies, the vendor spokesman maintained.

Real Decisions also introduced Dartlib, an extended library of standardized financial statements that reportedly are available as an add-on feature to Dart.

Dartpac is available for the price of $15,000. Dartmaster requires Dartpac ($15,000) and is available for an additional $15,000, according to the vendor spokesman.

Real Decisions is located at 123 High Ridge Road, Stamford, Conn. 06905.

Marketing Package Available for DOS, MVS

WHITE PLAINS, N.Y. — An on-line software package for the direct marketing industry will be sold in North America as a result of a joint venture by Datacrown, Inc. of Toronto and Direct Marketing Associates of Sweden.

Available to remote computing clients through Datacrown, Advanced Direct Marketing Software (ADMS) will also be available for use on in-house systems running under DOS/VS, DOS/VSE or MVS operating systems.

ADMS is an IBM-based package available in any combination of eight modules to automate direct marketing promotional and fulfillment functions. Such functions include continuity, negative option club, mail order/catalog and magazine subscription systems.

Available in the first quarter of 1983, ADMS costs $200,000 (U.S.) for all eight modules. ADMS will be marketed and supported in the U.S. by Direct Marketing Software Systems, Inc., 2 Gannett Drive, White Plains, N.Y. 10604.

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Infonet Gets Currency Aid For Managers

EL SEGUNDO, Calif. — Computer Sciences Corp. has added a service to its Infonet time-sharing network designed for financial managers dealing extensively in foreign currencies.

Conticurrency helps executives control their exposure to unfavorable shifts in exchange rates by providing daily exchange rates for 40 currencies and analyses of the economic, political and technical trends affecting financial markets, the company said.

The service consists of daily, weekly and monthly market reports and commentaries, as well as a data base of foreign exchange and interest-rates, the vendor claimed.

Conticurrency is CPU time-priced with no front-end charges from Computer Sciences Corp., 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

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Legal Data Base Offered Via T/S

PALO ALTO, Calif. — An on-line legal data base has been made available via time-sharing by the Bureau of National Affairs, Inc. (BNA) and Dialog Information Services, Inc.

Laborlaw reportedly provides access to a vast well of U.S. labor law information. It is based upon six BNA printed labor texts that cover labor-related legal topics dating back to 1967.

Laborlaw can be accessed via any general-purpose CRT terminal, a telephone and some operating instructions, the vendor said. Users are charged $120/hour access time, and no other charges are involved, the vendor said from 3460 Hillview Ave., Palo Alto, Calif. 94303.

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Schedule	
~~Baltimore~~	~~October 26/27~~
~~New York~~	~~November 3/4~~
Pittsburg	November 9/10
Dallas	November 17/18
Houston	December 1/2
Denver	December 8/9
Calgary	December 14/15
Los Angeles	January 12/13
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Fixed Asset Tool Out for HP 3000

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has announced a fixed assets and depreciation package for Hewlett-Packard Co. HP 3000 systems.

Written in HP Cobol, the package allows users to choose any generally accepted depreciation method for each asset. The package also can handle provisions of the Tax Equity Fiscal Responsibility Act of 1983.

It also tracks investment tax credits and can be used for early disposition recapture, the vendor said.

The package, including source code, costs $4,500. Additional CPU licenses are available at a discount, MCBA said from 2441 Honolulu Ave., Montrose, Calif. 91020.

Cash Flow Extension Package For HP 3000 Uses Image DBMS

PALM DESERT, Calif. — Cort Data Services has introduced a Cash Flow Extension and modeling software package for the Hewlett-Packard Co. HP 3000.

Cafe is an on-line, interactive package that utilizes HP's Image data base management system, the vendor explained. Its standard features include consolidation of models, equations, built-in mathematical functions, user-defined formulas, on-line tutor and table look-up.

Cafe reportedly has no special terminal requirements. It is menu-driven and includes optional direct commands and batch capability, which the vendor said is designed to minimize input and optimize hardware usage.

Written in Cobol, Cafe is said to have segments of less than 9600K bytes to avoid thrashing. The software was designed for conserving CPU and memory, the vendor said, and disk storage is allocated within bounds set by the user. Work areas are automatically purged after use.

Cafe is priced at $6,500, with discounts available for multiple sites. A 45-day trial is available for $150, the vendor said from 74-320 Highway 111, Palm Desert, Calif. 92260.

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HP 3000 Gets Processing Tool

AUSTIN, Texas — Tymlabs Corp. has announced a menu processing package for users of Hewlett-Packard HP 3000 series processors.

The package allows both on-line and batch processing to be controlled from any terminal. In addition, the package allows the user to control execution of any step in an application with more than a single processing phase, according to a vendor spokesman.

The package costs $850. A demonstration version is available for $50, Tymlabs said from 211 E. 7th St., Austin, Texas 78745.

Library Version Runs on HP 1000

HOUSTON — IMSL, Inc. has announced Edition 9 of its Library, a collection of Fortran subroutines, for the Hewlett-Packard Co. 1000 series computer systems.

With the latest edition, the Library now consists of over 540 Fortran subroutines designed for maximum accuracy and efficiency in mathematical and statistical problem solving, the company said. The Library is available on 19 computer tapes.

The subroutines serve as building blocks in the development of scientific and engineering applications programs, covering a range of applied math and statistics, the vendor said.

Annual subscriptions for the Library are $2,000, with $1,500 annual renewals from IMSL, Inc., Sixth Floor, NBC Building, 7500 Bellaire Blvd., Houston, Texas 77036.

'Etrend' Controls Machine Status

CINCINNATI — Entek Scientific Corp. has announced a software package for machinery condition monitoring applications.

The Entek Machinery Vibration Trending (Etrend) package was designed around the vendor's Entek Programmable Spectrum Analyzer (Epran) software and can only be used in conjunction with it, a spokesman said.

The system reportedly controls the measurement of a vibration spectrum on a single- or dual-channel spectrum analyzer. Measured data can be compared to a baseline spectrum and an accept/reject indication can be printed or displayed, according to the vendor.

The baseline spectrum can be developed either by measurement of an actual spectrum or by keying in a series of windows in the frequency spectrum as an envelope of allowable vibration levels, the vendor explained.

Etrend runs on most Hewlett-Packard Co. desktop computers and costs $1,500. Epran costs $1,950, the vendor said from Suite 316, 4480 Lake Forest Drive, Cincinnati, Ohio 45242.

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8" SSDD IBM Compatible (128 B/S, 26 Sectors)	741-0	2.89
8" DSDD Soft Sector (Unformatted)	743-0	3.49
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8" DSDD Soft Sector (512 B/S, 15 Sectors)	743-0/512	3.49
8" DSDD Soft Sector (1024 B/S, 8 Sectors)	743-0/1024	3.49
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5¼" SSDD 18 Hard Sector w/Hub Ring	744D-16RH	2.34
5¼" DSDD Soft Sector w/Hub Ring	745-0RH	3.09
5¼" DSDD 10 Hard Sector w/Hub Ring	745-10RH	3.09
5¼" DSDD 16 Hard Sector w/Hub Ring	745-16RH	3.09
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SSSD = Single Sided Single Density; SSDD = Single Sided Double Density; DSDD = Double Sided Double Density; SSQD = Single Sided Quad Density; DSQD = Double Sided Quad Density; TPI = Tracks per inch.

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Scotch Velostat Electrically Conductive Floor Mats, drain static charge before it can cause serious problems with computer or word processing equipment. Order number 1853 is a black 4' x 5' size mat with lip. Cost is $170.00 each. Order number 9453 is the same mat, but the color is earthtone brown, which is designed to blend with any office decor. Cost on the 9453 mat is $259.00 each. All Velostat mats come complete with 15 feet of ground cord. All mats are shipped freight collect.

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Scotch Data Cartridges are available from CE in three different configurations. The DC100A data cartridge is a small version of the DC300A data cartridge. The DC100A contains 140 feet of 0.150" tape in a package measuring 2.4 x 3.2 x 0.5 inches. Cost is $14.00 each. The DC300A is a pre-loaded tape cartridge containing 300 feet of one mil thick by ¼" computer tape. The DC300A costs $18.00 each. The DC300XL is an extra length data cartridge with 450 feet of tape. It is the same size and interchangeable with the DC300A. The DC300XL provides a total storage capacity of 34.5 million bits at 1600 BPI. The cost of the DC300XL is $22.00 each.

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Business Graphics Package Announced for DEC VAX-11

PLACENTIA, Calif. — Data Processing Design, Inc. has introduced a menu-driven software package that reportedly provides users of Digital Equipment Corp. PDP-11 and VAX-11 systems with business graphics capabilities.

IB Graph allows nontechnical personnel to create bar, line and pie charts on a variety of graphics output devices, the vendor explained. The menu-oriented system consists of a set of Help screens — a main menu, a data group editor, a chart specification editor module, a plot module, a utility module and a data translation module, according to the vendor.

The price of IB Graph for users operating under VAX/VMS is $9,500 for the PDP-11/780, $8,500 for PDP-11/750 and $7,500 for PDP-11/730. The price for the product running under RSTS/E is $7,500 for the PDP-11/70, $6,500 for the PDP-11/44 and $5,500 for all others, the vendor said. Data Processing Design is located at Suite F, 181 W. Orangethorpe, Placentia, Calif. 92670.

Work Sheet Fits DEC Machines

MINNEAPOLIS — An electronic work sheet for Digital Equipment Corp. PDP-11, VAX-11 and LSI-11 users has been developed by Saturn Systems, Inc.

Saturn-Calc, written in assembly language, reportedly offers such mathematical operations as sums, averages, "what if" statements and algebraic functions. The software runs on RSX-11, RT-11, RSTS, VMS and TSX-Plus operating systems.

For RT-11, the package costs $489; for TSX-Plus, $978; and for RSX-11, RSTS or VMS, $1,956 from the firm at 6875 Washington Ave. S., Minneapolis, Minn. 55435.

Billing System Targets Utilities

LOS ALAMITOS, Calif. — Software Techniques, Inc. has unveiled a new integrated billing and accounts receivable system designed especially for water companies.

Water Billing System-11 (WBS-11) operates on Digital Equipment Corp. PDP-11 computers running under RSTS/E operating systems. The product reportedly protects against data loss by using a magnetic tape journaling system. It also offers menu selection, security options, the ability to accept data in a variety of formats and the ability to arrange data in standard formats, the vendor said.

The price for WBS-11 ranges from $20,000 to $80,000, depending on the number of people in the water district. Further details are available from the vendor at 5242 Katella Ave., Los Alamitos, Calif. 90720.

NEC Astra Line Gets Accounting, WP Aid

LEXINGTON, Mass. — NEC Information Systems, Inc. has announced Laws, a legal accounting and word processing package for the firm's Astra series of processors.

Laws reportedly can monitor the progress of client files, giving the user access to case information such as when it was last worked on, by whom, how much time has been spent to date and payments received. Other features include docket control, statement preparation, aged accounts receivable and a personal electronic data book with tickler file.

The package runs on Astra 200 hard disk models as well as the firm's mid-range Model 230 systems. It costs $7,000 from NEC, 5 Militia Drive, Lexington, Mass. 02173.

Change. It's the heartbeat of the computer industry. But change happens so fast in this business that few can keep up with it, let alone interpret what it *means*. The "Forecast '83" issue of *Computerworld* will do just that — reporting not only what happened in the computer industry and what may happen, but also what those changes mean to both the industry and end users in the turbulent year ahead.

The entire editorial staff of *Computerworld* is working full time to review the key events of 1982 and how they will affect your business in 1983. Staff writers, senior writers, writer/analysts, senior editors and correspondents — a combined total of more than 175 years' experience in computer journalism — will provide the facts and forecasts that will shape the computer industry next year.

They're looking at underlying trends in the industry; they're checking with the experts and the industry giants; they're reading the studies, the reports, the research. And, to take the true pulse of the industry, they're doing what professional journalists do best — conducting extensive interviews with DP/MIS executives across the country.

This is *the* issue that puts what's happened in the past year into perspective. You'll get analysis, you'll get trends, you'll get a feel for the way the industry has responded. Here's what's in store for you:

- You'll learn what the industry giants are doing in various market segments — and what *their* plans may mean to *your* business.
- You'll get a close-up look at end-user computing and its impact on DP/MIS departments.
- You'll get a look at the economic underpinnings of the computer industry and how those forces will drive the industry in 1983.

In other words, you'll get all the insight you need to do your strategic planning for the months ahead.

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8" DSDD Soft Sector (256 B/S, 26 Sectors)	F144	3.19
8" DSDD Soft Sector (512 B/S, 15 Sectors)	F145	3.19
8" DSDD Soft Sector (1024 B/S, 8 Sectors)	F147	3.19
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5¼" Same as above, but bulk pack w/o envelope	M11AB	1.39
5¼" SSSD 10 Hard Sector w/Hub Ring	M41A	1.59
5¼" SSSD 18 Hard Sector w/Hub Ring	M51A	1.59
5¼" SSDD Lanier No-problem compatible	M51F	2.99
8¼" SSDD Soft Sector w/Hub Ring	M13A	1.89
5¼" Same as above, but bulk pack w/o envelope	M13AB	1.69
5¼" SSDD Soft Sector Flippy Disk (use both sides)	M18A	2.79
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5¼" SSDD 18 Hard Sector w/Hub Ring	M53A	1.89
5¼" DSDD Soft Sector w/Hub Ring	M14A	2.79
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5¼" DSDD 16 Hard Sector w/Hub Ring	M54A	2.79
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5¼" DSQD Soft Sector w/Hub Ring (96 TPI)	M16A	3.79

SSSD = Single Sided Single Density; SSDD = Single Sided Double Density; DSDD = Double Sided Double Density; SSQD = Single Sided Quad Density; DSQD = Double Sided Quad Density; TPI = Tracks per inch.

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[illegible] its full-scale UNIX*

Utility Designs Code for B5000, B6000, B7000

MINNEAPOLIS — Technalysis Corp. has announced a utility software program that reportedly allows users of Burroughs Corp.'s B5000, B6000 and B7000 systems to design and generate code for CRT screen layouts used in on-line applications.

The Large Systems Screen Formatter Package (LS/SFP) lets programmers design screen layouts on CRTs just as they would appear to the end user, and it automatically generates and debugs Cobol or Burroughs proprietary Generalized Message Control System Transaction Control Language source code for the layouts, the vendor said.

The package reportedly utilizes all of the standard highlighting features of Burroughs terminals, and cursor positioning is used wherever possible to reduce data transmission time. Multiple users can use the LS/SFP simultaneously, according to the vendor.

This product is priced at $5,000. Further details can be obtained from the vendor at 6700 France Ave. S., Minneapolis, Minn. 55435.

'Visicalc' Tied To Mark III T/S

BOISE, Idaho — Accounting Systems, Ltd. has announced a software package that reportedly interfaces Visicorp's Visicalc software with General Electric Information Services Co.'s (Geisco) Mark III remote computing service.

This Visicalc interface extracts accounting data maintained on Geisco mainframe computers, converts it to Data Interchange Format file format (a standard data interchange format from Software Arts, Inc. which can be read by Visicalc) and transmits the data to a user's IBM Personal Computer, according to the vendor. The interface reportedly allows the user to perform budgeting, forecasting and "what-if" analysis on the microcomputer with information from the Geisco data base.

Mark III subscribers are charged for this service by connect time and resources used. Further details can be obtained from Accounting Systems, Ltd. at P.O. Box 1488, Boise, Idaho 83701.

Spreadsheet Package Fits Iris Systems

LOVELAND, Colo. — A $700 spreadsheet package designed to run on computers using the Point 4 Data Corp. Iris operating system has been introduced by Computer Technology Systems, Inc.

Mastercalc is said to cost less than half the price of existing programs. Written in Basic, Mastercalc is compatible with Point 4, Data General Corp. and Ardent Computer Products, Inc. desktop computers. It is said to run on any computer using the Iris operating system with 64K or more of memory.

Computer Technology Systems is located at 1531 N. Lincoln Ave., Loveland, Colo. 80537.

'Readycalc' Runs On Wang Micros

NEWTON, Mass. — Human Systems, Inc. has announced Readycalc, an electronic spreadsheet package for Wang Laboratories, Inc. word processing systems and microcomputers.

Readycalc reportedly allows users to perform math operations within a multicelled matrix. The package offers the ability to recalculate automatically spreadsheets if some information changes at the last minute.

Readycalc is said to run on any Wang system with WP capabilities and Wang's Mathematics Support Package.

The package costs $500, the vendor said from Suite 360, 719 Washington St., Newton, Mass. 02160.

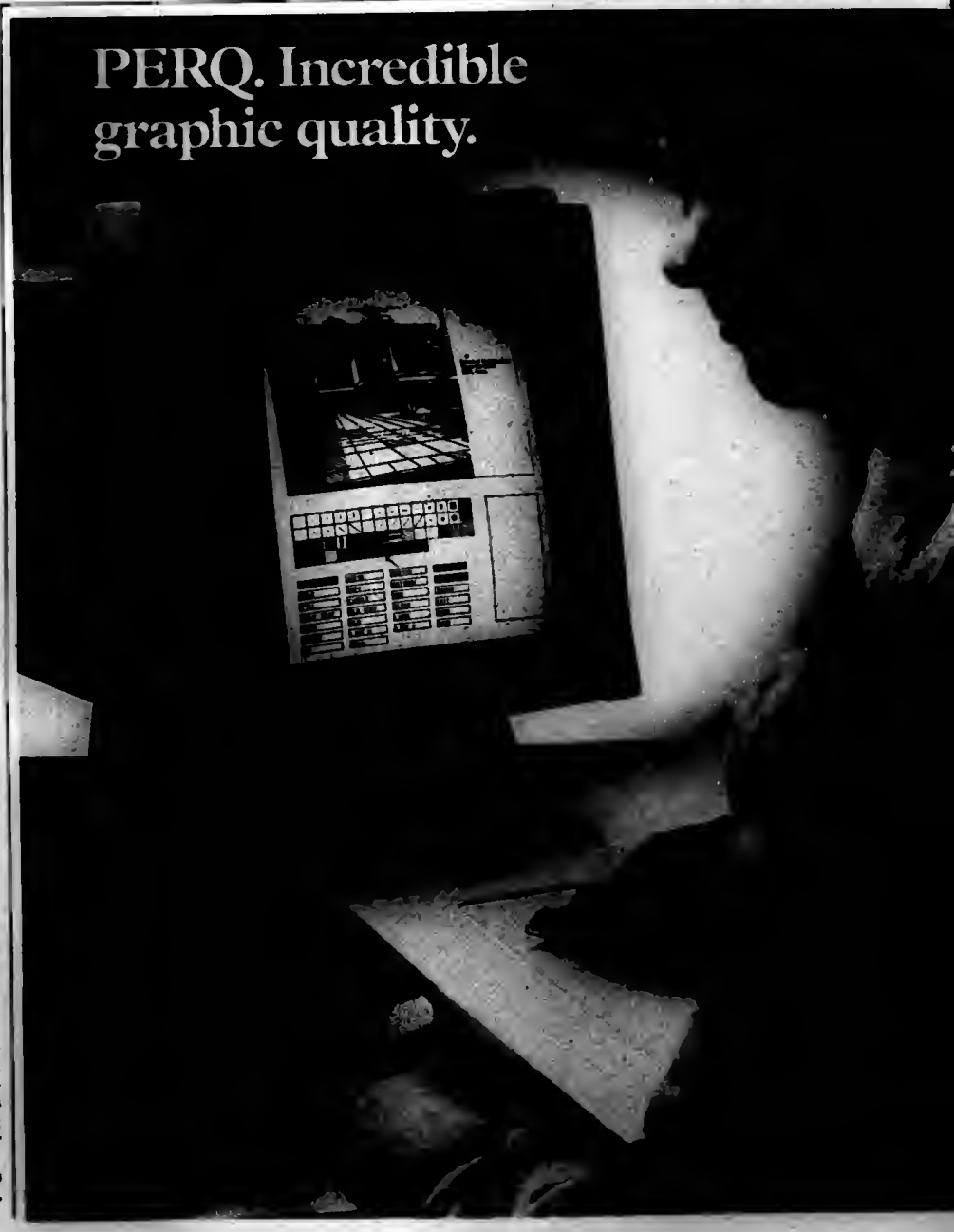
Module for Wang VS Transfers Files, Performs Spreadsheet Consolidation

RICHMOND, Calif. — Soft Pro System, Inc has announced a spreadsheet consolidation and data processing file transfer module for users of the Wang Laboratories, Inc. VS computer.

Called Phicat, the package consists of two parts. The consolidation component handles consolidation of the company's Phimod work sheets. It reportedly can consolidate from 99 fields of 16 different parameter work sheets at any time for each output cell. Figurative constants are allowed in the consolidation operations and consolidation rules and can be changed interactively and saved for future use.

The transfer component is said to provide a data processing interface file. This allows two-directional flows of information between data processing files and Phimod work sheet files, according to the rules specified by the transfer rule file. User specified labeling of the data processing interface file is provided with up to 20 characters of remark field associated with each label field. The transfer rule file can be saved and recalled or printed.

Phicat costs $500 from Soft Pro at 4121 MacDonald Ave., Richmond, Calif. 94805.



CAD Package Announced For Harris Minicomputers

FORT LAUDERDALE, Fla. — Harris Corp. has announced a computer-aided design package for high-frequency and microwave circuits that run on the company's full line of minicomputers.

The package, called Super-Compact, employs interactive graphics to design, analyze and optimize microwave integrated circuits and high-frequency active and passive circuits, a spokeswoman said.

The user can select from multiple analysis and optimization options that can be applied to virtually any circuit design problem. Analysis can be carried out on active or passive linear circuits having up to four ports in ladder or nodal modes, the spokeswoman said. Tabular or graphics analysis output can include S-, Y- or Z-parameters, noise figure and group delay.

Rectangular plots and Smith charts for plotting frequency response, constant noise, constant gain and stability circles can be generated interactively. A Monte Carlo analysis feature can be used to predict performance spreads due to tolerance effects.

Super-Compact costs $61,500 from Harris's Computer Systems Division at 2101 W. Cypress Creek Blvd., P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Interactive Version of APL Fits Prime 50 Series Under Primos

NATICK, Mass. — An interactive version of the APL programming language has been made available for Prime Computer, Inc. computer users through Prime's Joint Marketing Program.

Developed by Mips Software Development, Inc., this implementation of APL reportedly provides a range of features and language extensions that enhance its power and flexibility within any application environment. The product includes a large user work space, expandable to 32M byte/user; a shared reentrant interpreter for efficient memory utilization; a built-in debugging capability; numerous system functions and variables; and extensive APL and Ascii terminal support, according to the vendor.

This product is compatible with all Prime 50 series computer systems operating under the firm's Primos operating system, the vendor said. It is available for $14,500. Further details are available from Prime at Prime Park, Natick, Mass. 01760.

'Spellwright' Out For Prime, DEC

FRAMINGHAM, Mass. — A spelling correction software package for Prime Computer, Inc. minicomputers and Digital Equipment Corp. VAX-11 machines has been introduced here by Multi-Computer Systems.

Called Spellwright, the package can be used in conjunction with various other text-oriented applications, according to the vendor. This product allows text to be simultaneously verified against not only its own 40,000-word dictionary, but also by up to eight locally created master or personal dictionaries. Using a simple interface, Spellwright can add spelling correction capability to a developer's own application or products.

Spellwright is a base-priced at $1,999, the vendor said from 26 Forest Road, Framingham, Mass. 01701.

Travel Agencies Get Tracking Aid

LA CRESCENTA, Calif. — Business Information Systems (BIS) has announced a fee tracking system for travel agencies to enhance its line of travel packages for Prime Computer, Inc. 50 series computers.

The BIS package tracks fees for both auto rental and hotel deposits for travel agencies and automatically generates collection letters. It also handles airline reservations, commercial accounts receivables, multiagency capabilities and collection processing, the spokesman said.

The package can be integrated with BIS general ledger software as well as with other packages to handle invoicing, inventory control, distributed processing and data communications.

The fee tracking package costs $15,000 from BIS at 2428 Foothill Blvd., La Crescenta, Calif. 91214.

Seismic Package Out

HOUSTON — Seismic processing software designed to run on Prime Computer, Inc. 50 series computers has been developed by Exploration Consulting Associates, Inc. (ECA).

The Seismic Processing Package, capable of such seismic operations as normal moveout, common depth point stacking, deconvolution and mutes, costs $50,000. It is also available as a turnkey system starting at $160,000 for the software and a Prime 250 and topping off with the Prime 850 with array processor at $617,000.

ECA is at Suite 960, 2600 Southwest Freeway, Houston, Texas 77098.

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PERQ is the graphic workstation for professionals, and its graphics have to be seen to be believed. While other display images lose clarity when repositioned, PERQs don't. That's because our 1024 line screen is refreshed 60 times per second. PERQ is non-interlaced, so the image you create is the one you keep.

This display, supported by PERQ's 32 bit virtual address processor and your choice of 512 or 1024 KB of memory, is available now as a stand-alone or in a local area network. What's more, you can now get PERQ with five new software packages.

System D/L Three Rivers' own computer-aided logic design package. System D/L lets you design your schematics on screen, and its hierarchically structured design data base checks your work for errors. You can then generate output to drive standard wire-wrap, P.C. or gate-array layout systems. A complete hardware/software package for under $35,000.

SORITEC™ Developed by the Sorites Group, Inc., this machine-transparent modelling system combines econometric, financial, statistical and simulation capabilities in one easy-to-use system. SORITEC also has a report writer and databanking facility. And, when implemented on PERQ, has all the power and features of the original mainframe version.

PERQ Document Management System (DMS) Developed by Information Technologies, this is the first in its family of applications systems based on ZOG (a general purpose, human-machine interface system developed at Carnegie-Mellon University). Reflecting ZOG's menu-selection and rapid-response approach, DMS manages the professional's documentation from the initial stages of communication and writing, through the editing and printing, to the storage and distribution processes. Easy to learn, DMS provides a hierarchical structure that makes "browsing" and updating large masses of information convenient and efficient for engineers, scientists, and all types of managers.

GRAPHNET A complete, interactive graphics CAD package developed by Graphics Horizons, Inc. It includes capabilities in data management, layout optimization, drafting, layered and perspective drawings. This is a wholly new Computer Integrated Design System for architects, engineers and designers, and the only complete spectrum Computer Integrated Design package at an affordable price.

METAFORM Developed by Intran, Inc., Metaform is an interactive workstation for designing and managing forms, fonts, and graphics for the Xerox 8700 and 9700 electronic printing systems. Because users can create, edit and store all items locally on the workstation's hard disks, the Xerox printer is freed for its intended task: high volume printing. The system is easy to use while still appealing to the technically sophisticated user. Best of all, Metaform displays each page exactly as it will appear when printed.

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Microfiche Support System Out for NCR VRX Users

MINNEAPOLIS — Century Associates, Inc. has made its Qwik-Com microfiche support system available to users of NCR Corp.'s VRX operating system. The system was previously available only to users of NCR's B Series.

Qwik-Com is controlled by coding a series of functions in the Spec$ format. The instructions execute at runtime, so that the control of Qwik-Com can be based on the quantity and type of data actually encountered, a spokesman said.

The user can extract certain pages to be recorded based on data contained on each page. New page formats can be detected and recorded on a new piece of film. Title and index-entry formats can also be changed in midstream in accordance with input variations. The package reportedly can also access VRX spool and interim files directly.

Output tapes are said to be acceptable to nearly any microfiche reader, even those without a computer-based controller. The VRX version of the package costs $5,000 with the B3 version priced at $3,000 from Century Associates at 8120 Penn Ave. S., Minneapolis, Minn. 55431.

Upgraded Quest Fits NCR CPUs

CINCINNATI — Software Clearing House has announced an on-line user-oriented inquiry/reporting system for users of NCR Corp. computers.

Developed by Mathis and Associates, Quest/ol is said to offer all the capabilities of Quest, an earlier batch auditing and reporting product, but is not an on-line retrofit of the earlier product. Quest/ol has been redesigned and recoded using a version of the Forth system development language for NCR users.

Quest/ol costs $6,475 with discounts available for current users of Quest, according to Software Clearing House at 771 Neeb Road, Cincinnati, Ohio 45238.

Software Guide Aimed at Users

NEW YORK — "The Guidelines for Evaluating and Selecting Software Packages," by Irv Brownstein and Nancy Lerner of the Productivity Group, Inc. here, is available from Elsevier Science Publishing Co., Inc.

Aimed at DP professionals and computer users, the guidelines reportedly show how to determine user requirements, perform a make vs. buy analysis, determine the major software contenders, evaluate operational performance and how to interface the product with existing systems.

The guidelines are published in a loose-leaf format for $75. After Dec. 31, the price will be $95.

For those who want to customize the guidelines for internal use, the text is available on 8-in. floppy disks suitable for running on Wang Laboratories, Inc., IBM and other word processors. The fee for the floppy disk version is $500.

Further information can be obtained from D. Arters, Elsevier Science Publishing Co., 52 Vanderbilt Ave., New York, N.Y. 10017.

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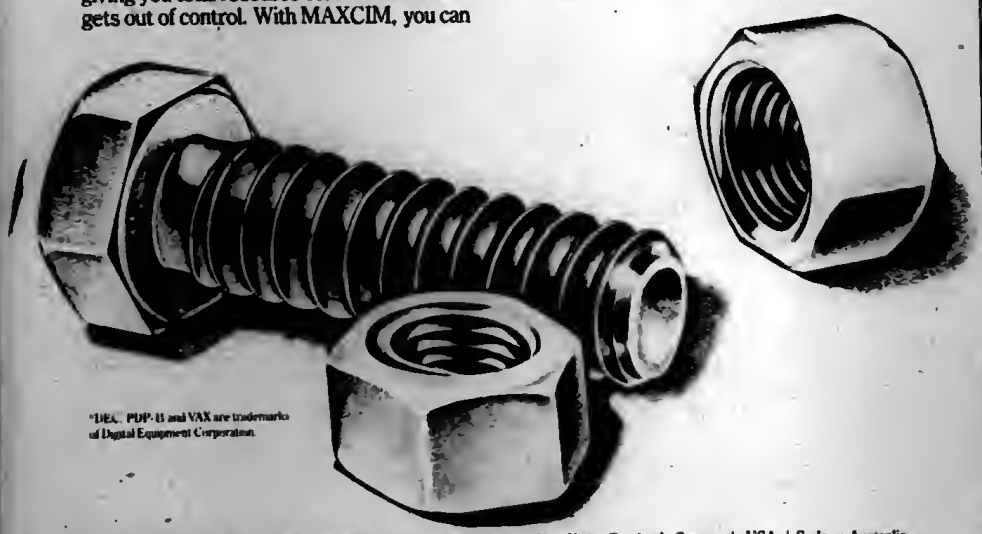

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Alternatives To Dropped 3270s

CHERRY HILL, N.J. — Now that IBM is dropping a number of 3270 information display products, the only alternatives to those discontinued products will come from other vendors, according to a recent survey done by Data Decisions (see accompanying story).

Those companies include Agile Corp.; Associated Computer Consultants, Inc.; Beehive International, Inc.; Braegen Corp.; Carterfone Communications Corp.; Codex Corp.; Computer Optics, Inc.; Data Retrieval; Datamedia Corp. and Datastream Communications, Inc.

Also, Honeywell, Inc.; Icot Corp.; Informer, Inc.; Innovative Electronics, Inc.; Intersil Systems, Inc.; ITT Courier Systems, Inc.; KMW Systems; Lee Data Corp.; M/A-COM; Inc.; MDS Trivex, Inc.; Megadata Corp.; Memorex Corp.; Northern Telecom, Inc.; Paradyne Corp.; Perle Systems, Ltd.; Phone 1, Inc.; Racal Milgo, Inc. and Raytheon Data Systems Co.

IBM 3270 Line Offering 'Significantly' Reduced

By John J. Hunter
Special to CW‡

CHERRY HILL, N.J. — The IBM 3270 information display system is one of the most successful products ever to enter the data processing marketplace. There are more than 600,000 now in the field, according to a recent survey conducted by Data Decisions, Inc.

Introduced in 1972, the system was so popular and demand for it was so great that, on certain products, delivery times of nne year were common. In light of this demand, a number of vendors rushed to provide 3270 look-alikes, hoping to capitalize on the high price and long lead time that went with the IBM offerings. Although many models in the 3270 series are now being dropped, their equivalents are still available from many vendors.

All the original components except Model 2 of the 3277 keyboard display are being dropped, as is the 3284 modem line. These withdrawals, added to the earlier elimination of the 3274 Model 1C control unit, the 3278 Model 1 keyboard display and some other minor options, significantly reduce the 3270 line offering.

The trimmed-down 3270 will consist of the 3274 Models 21A through 21D, 31A, 31C, 31D and 51C; 3276 Models 1 through 4 and 11 through 14; 3277 and 3278 Model 2 keyboard displays; the 3279 color display station; and 3287, 3289 and 3262 printers.

The third-party products replacing the 3271 and 3272 controllers; 3275 standalone terminal; 3284, 3286 and 3288 printers; and Model 1 of the 3277 and 3278 terminals are now the only games in town.

(Continued on Page 74)

Input Requested On Communications

The Jan. 31 *Computerworld* Special Report on data communications networks will address the communications explosion and how users are trying to harness it. We want you to contribute to the special report

You can address any key networking issue. For example:

- How can reliability, integrity and security be obtained and maintained?
- What is new with packet-switching networks?
- What are the long- and short-haul alternatives to Bell?
- When is a private branch exchange more appropriate than a local-area network based on coaxial cable?

We also welcome articles or experiences concerning network planning and management; protocol conversion; and data communications in the office; or topics such as what's the future of AIS/Net 1000 or will personal computers replace the IBM 3270?

Articles should be between four and seven pages, typewritten and double-spaced and can be submitted with pictures, charts or graphics.

Dec. 10 is the deadline for manuscripts, which should be no longer than seven double-spaced, typed pages. They should be sent to either Bruce Hoard or Jim Bartimo, *Computerworld*, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Features 1M Bit/Sec Speeds

Ethernet System Line Unveiled

CUPERTINO, Calif. — Bridge Communications has unveiled a family of programmable high-performance communications computers that reportedly link diverse devices through Xerox Corp.'s Ethernet local-area network and link Ethernet to remote devices across long-haul X.25 public networks.

Bridge said that the Ethernet System Product Line (ESPL) is the first announced implementation outside Xerox of the Xerox Network System (XNS) high-level protocols. ESPL features 1M bit/sec throughput through all layers of protocol, the vendor claimed.

The first two members of the product family are the Communications Server/1 (CS/1), which allows up to 32 non-networked devices with RS-232 or RS-423 serial interfaces to connect to an Ethernet network; and the Gateway Server/1 (GS/1), which connects an XNS Ethernet to a host of the network with an X.25 interface

A set of modular hardware and software building blocks is the foundation of the CS/1, GS/1 and future products in the ESPL family. Each of the products is divided into three logical modules: the central communications processor module and two interface modules, (I1 and I2).

The EC/1 I1 Ethernet controller is a two-board set that interfaces the Ethernet at the data-link level. It is part of a module common to all ESPL products. One board is an Ethernet transceiver interface and the other a Motorola 68000-based Ethernet shared buffer with 128K bytes of dual-ported random-access memory.

The EC/1 controller board set is available separately for customers wishing to use it as a high-performance Ethernet interface in an Intel Corp. Multibus-based system. It will be available in February 1983 and costs $3,000.

The CS/1 will be available for $9,900 in March 1983, and the GS/1 will be available in the second quarter of 1983 and will cost $15,000.

Bridge Communications is located at 10401 Bubb Road, Cupertino, Calif. 95014

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Televideo Units Get Modem

SANTA CLARA, Calif. — Microbaud Systems, Inc. has introduced an integral originate-and-answer modem for use with Televideo Systems, Inc.'a Models 910, 920, 925 and 950 CRT terminals.

The single-board Model MB80505 has been designed for direct mounting in the terminals and is said to provide full-duplex, two-wire operation at 300 or 1,200 bit/sec over a switch telephone network. The modem allows the terminals to dial automatically from the keyboard, redial up to 15 times, answer incoming calls and perform self-test when idle.

The modem is available for $700 from Microbaud at 3393 De La Cruz Blvd., Santa Clara, Calif. 95050.

Fits Advantage Desktop

Package Aids Desktop Emulate Terminals

CONCORD, Calif. — Thomas Engineering has introduced a software package said to enable a Northstar Computers, Inc. Advantage desktop computer to emulate an IBM 3101 or Honeywell, Inc. VIP 7200 terminal. The software is available in three separate modules that provide character-mode, block-mode and file transfer capabilities.

The modules are priced at $350, $200 and $100, respectively, a vendor spokesman said.

The company is also offering a turnkey system that includes the software and the Advantage computer. The Advantage is an integrated computer consisting of a 12-in. CRT, keyboard, Zilog, Inc. Z80A CPU, 64K bytes of random-access memory, two floppy disks and business graphics software.

The turnkey package is available for $3,595, according to the vendor spokesman.

More information is available from Thomas Engineering, Suite 106, 1040 Oak Grove Road, Concord, Calif. 94518.

Survey Evaluates 3270 Emulation

(Continued from Page 73)

For those whose needs do not call for a 3274 or 3276 controller and their peripherals, these products provide an alternative source at very favorable prices, according to the Data Decisions survey.

The 3270 substitutes divide roughly into two general categories: plug-compatible replacements and protocol converters. The plug-compatible products are hardware components that can be used in lieu of the IBM products. These units generally emulate their IBM counterparts (including weaknesses) and can be implemented in totally transparent mode; no hardware, software or operational modifications to existing equipment are required.

Protocol converters permit incompatible terminals or printers to operate in a 3270 environment by modifying the peripheral's protocols and emulating the characteristics of the replaced devices. The converters are usually black boxes into which the low-cost non-IBM terminals or printers are plugged. The message stream output to the 3270 controller looks like that generated by a 3277, 3278 or 3287. The converter reverses the process with data received from the host.

Another kind of product, called a controller emulator, provides an even better cost alternative. This device emulates a 3270 cluster controller and allows users to attach low-cost asynchronous Ascii terminals in lieu of higher priced IBM offerings. For example, Datastream Communications, Inc. sells a family of controllers that emulates the 3271, 3274 and 3276 and allows terminals priced well under $1,000 to substitute for the higher priced IBM units.

While protocol converters do not provide all the services of a controller emulator, they are priced substantially less. They can also be purchased with as little as one terminal/printer interface and permit significant savings through the use of products priced far below IBM products.

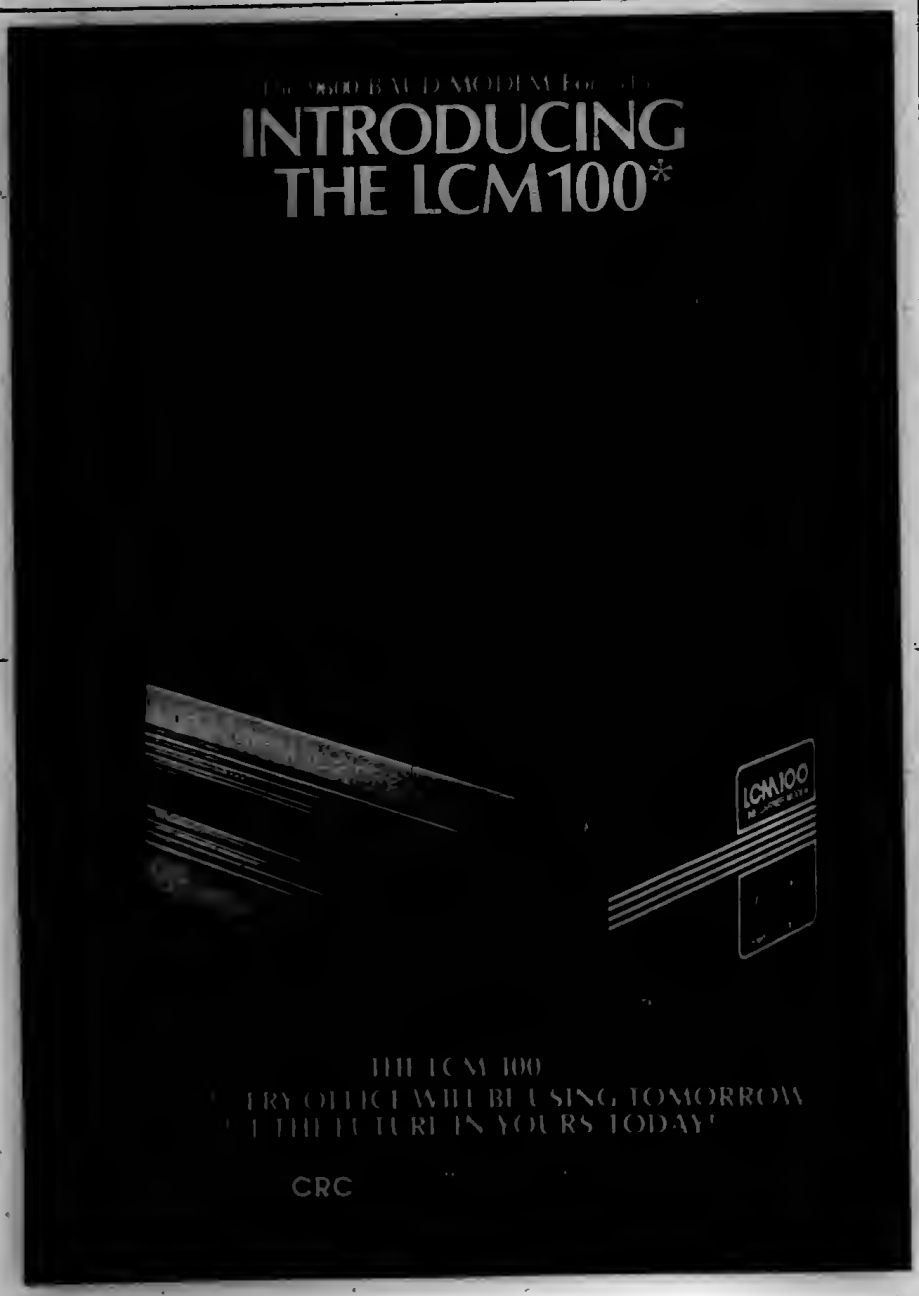
Other vendors are also offering add-on products that can be used with the IBM product lines to cut costs. One such device is a multiplexer that can combine inputs from up to 32 locally attached terminals or printers over a single cable to the 3270 controller. 3M Corp.'s Series 6600, Ungermann-Bass, Inc.'s CMS Series and Fibronics International Ltd.'s multiplexer provide such services.

Lee Data Corp. offers still another approach. This company markets a controller that emulates a 3274 and provides a single terminal that has all the features of the 3278 Models 1 through 5. The Lee cluster controller also allows asynchronous Ascii terminals to be connected for operations in native mode.

In addition to these specific products, a number of intelligent terminal and computer mainframe manufacturers offer software or firmware that allows their products to emulate a 3270 component.

The survey, which includes alternatives to the remaining restructured 3270 line, is available for $25 from Data Decisions at 20 Brace Road, Cherry Hill, N.J. 08034.

Hunter is a senior editor/analyst with Data Decisions.



Telephone Reporting System Out For Small Businesses With PABXs

SEATTLE — Management Data Services has announced the MDS-100, a telephone reporting and management system for small businesses using a digital private automatic branch exchange (PABX).

The MDS-100 provides users with detailed reports and cost records of company telephone activity. All telephone information is captured as it travels through the PABX. The system can accommodate businesses with up to 500 telephone lines, the vendor said.

In addition, the MDS-10 can provide additional functions such as credit card control, automatic directory lookup, automatic chargebaek for client billing and automatic call distribution, the vendor said.

A typical MDS-100 system costs $30,000, Management Data Services said from 32830 Pacific Highway S., Kent, Wash. 98032.

Dual Modem Announced

WOODBURY, N.Y. — Remark Datacom, Inc. has introduced a dual short-haul modem designed to interface with other short-haul modems in an asynchronous network.

The Model 75 provides two modems capable of operation from 300 to 9,600 bit/sec, full duplex, using two twisted pairs. Each modem reports its operating status to the user, and each modem is equipped with a loop-back switch. Transmission at 9,600 bit/sec over a distance of two miles or 1,200 bit/sec over a distance of 10 miles is allowed, the vendor said.

The Model 75 is available for $165 ($82.50/modem) from Remark Datacom, 4 Sycamore Drive, Woodbury, N.Y. 11797.

Short-Haul Mux Runs Up to 2 km

CHATSWORTH, Calif. — Canoga Data Systems has introduced a multiplexer that is designed for short-haul applications at distances up to two kilometers. The basic system offers 16 full-duplex channels which can be expanded to 64 channels.

The CMX-320 provides transmission speeds up to 19.2K bit/sec on all ports without hardware or software programming. A proprietary multiplexing technique is said to allow full maximum data rate on all channels simultaneously without the need for data buffering or terminal shutdown during peak loads. The multiplexer will also accept any combination of terminal devices regardless of code structure, a vendor spokesman said.

The basic CMX-320 is priced at $2,000, available from Canoga Data Systems, 21218 Vanowen St., Canoga Park, Calif. 91303.

Multibus Board Ups Serial Capabilities

WALTHAM, Mass. — Comark Corp. has introduced a multibus communicationa board that is designed to provide expansion of system serial communications capabilities.

The MS 534 board contains four serial input/output ports, capable of synchronous or asynchronous operation with RS-232C buffering. Each channel can be optionally configured by the user for 20mA optically isolated current-loop buffering, according to the vendor

Transmission rates, data formats and interrupt priorities are individually software-selectable for each channel, the vendor said.

The board is available for $550 from Comark Corp., 257 Crescent St., Waltham, Mass. 02154.

Enhanced Version of 802A Features Polling/Selection, X.25 Analysis

SAN JOSE, Calif. — Halcyon Communications, Inc. has announced an enhanced version of its 802A data link monitor.

The new features, available as options, include polling/selection capabilities, bit error rate testing, printer interface and X.25 protocol analysis.

The enhancement features equip the 802A for transmission and emulation as well as the monitoring of data. Bit error rate testing can be configured to run both end-to-end and loop-back tests, providing a means of determining the quality of transmission lines, the vendor said.

The 802A automatically detects line configuration at full-duplex speeds up to 56K bit/sec. It monitors all standard protocols including Synchronous Data Link Control, High-Level Data Link Control and Digital Data Communications Message Protocol. Other features include trapping, counting, statistical analysis, selective real-time recording and color output capability, according to the vendor.

The 802A is now available and is priced at $7,690 with the Printer/Poll/Bit Error Rate Testing option. With both the Printer/Poll/Bit Error Rate Testing and the X.25 options, it is priced at $8,685. More information is available from Halcyon Communications, Inc. at 2121 Zanker Road, San Jose, Calif. 95131.

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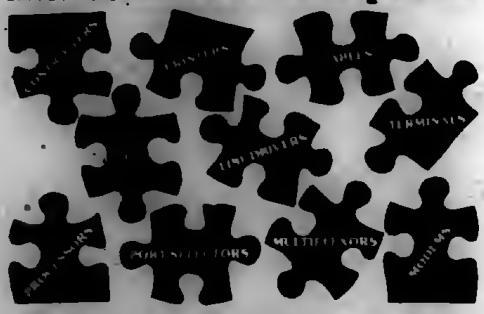

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Host Support Added to BCP For Most DDP Equipment

NEW YORK — Computer Dynamics, Inc. has announced that its Batch Communications Program (BCP) now provides host support for most distributed data processing (DDP) equipment, including personal and desktop computers, microcomputers, minicomputers, remote/batch terminals, data entry systems, word processing equipment and other types of DDP systems.

The BCP is a multitasking communications system that is said to support up to 100 communications lines and allows information to be passed back and forth between a mainframe and DDP equipment.

In addition to supporting equipment from Honeywell, Inc.; Wang Laboratories, Inc.; Xerox Corp.; and others, the program supports most DDP terminals using Binary Synchronous Communications, including2770, 2780, 3780, 3741 or 3270 protocols, according to a vendor spokesman.

The program is used primarily to receive information entered at the microcomputers or other DDP systems during the day and to send master files, reports or other types of information back to the DDP equipment. It will run on all IBM mainframes including all IBM 360 or 370 series, 3030 series, 4300 series and 3080 series host computers, the vendor spokesman said.

BCP is available for between $8,000 for the single-line version and $40,000 for the multitasking version. More information is available from Computer Dynamics, Inc., Suite 407, 390 Fifth Ave., New York, N.Y. 10018.

'Hyper-Link' Package Unveiled For Hyper-Channel Equipment

TROY, Mich. — Data Base Management Associates, Inc. has introduced a family of networking software products for the development of networked applications and control of mainframes and peripherals in conjunction with Network Systems Corp.'s Hyper-Channel processor and link adapters.

The software, called Hyper-Link, is made up of connection-oriented, end-to-end communications software modules designed to provide and fit into a layered hierarchy of protocols supporting multinetwork applications. It utilizes Transmission Control and Internet Protocols (TCP/IP) with Hyper-Channel hardware to move either large or small amounts of data between processors, peripheral devices and networks at data rates up to 50M bit/sec.

Hyper-Link provides simple transfer of data between IBM, Digital Equipment Corp., Burroughs Corp., Honeywell, Inc., Sperry Univac, Control Data Corp. and miniprocessors connected to the networking complex. Application processes available include network bulk file transfer, network remote job entry, network file sharing, network terminal passthrough and network administration, a vendor spokesman said.

Typical pricing for the basic Hyper-Link control software ranges from $21,000 to $28,000 per network node. Application modules range from $3,000 to $14,000. More information is available from Data Base Management Associates, Inc., 2820 W. Maple Road, Troy, Mich. 48084.

IDS Announces Four Products

LINCOLN, R.I. — International Data Sciences, Inc. (IDS) has announced four products which include, a Modem/Channel Simulator, a Spare Modem Back-Up Switch, a Portable Compact Test Set and a Bridge and Monitor Module.

The Model 9150 Modem/Channel Simulator is designed to inject random errors into both the transmitted and/or the received data in any synchronous data communications system. The model reportedly interfaces with all EIA-compatible synchronous modems and data terminals and is priced at $3,295.

The Model 8509-D Spare Modem Back-Up Switch is designed to switch the combined RS-232 and telephone line interface of a faulty on-line modem to a back-up system. This model is priced at $360.

The Portable Compact Test Set, Model 4020, allows problems caused by transmission errors, equipment malfunctions or intrinsic software problems to be analyzed and corrected. The IDS 4020 is priced at $1,995 for single-unit quantities.

The Model 8560 Bridge and Monitor Module allows on-line monitoring of data communications traffic on all 25 leads in the EIA data interface between modems, terminals and multiplexers. Its primary use is for on-line monitoring, fault isolation and testing. The Model 8560 is priced at $1,145. The vendor is located at 7 Wellington Road, Lincoln, R.I. 02865.

IBM 3600, 4700 Get Diagnostics

KIRKLAND, Wash. — Computer Management Consultants, Inc. (CMC) has introduced a diagnostic unit that is said to improve loop terminal availability for the IBM 3600 and 4700 Financial Communications System terminals. It is also said to reduce operating and capital costs.

The CMC 36/47 Star Circuit Diagnostic Unit is a diagnostic hub that combines digital and analog technologies in a modular, rack-mounted assembly. Special switching features allow failures to be bypassed during repair, reducing downtime, a vendor spokesman said.

A fully configured 20-line, five-loop version is available for $4,000 from CMC, Suite 200, 135 Lake St. S., Kirkland, Wash. 98033.

Simulator/Analyzer Aids Engineers To Control Net, Software Links

SANTA MONICA, Calif. — Tekelec, Inc. has introduced a multiprotocol simulator/analyzer said to allow engineers developing data communications networks or software to have a controllable "other end" of the link.

Chameleon would typically appear as a front-end processor, cluster controller or a data network with the added advantage of total control so that abnormal as well as normal situations can be exercised.

Chameleon works in Systems Network Architecture/Synchronous Data Link Control, High-Level Data Link Control, X.25 and Binary Synchronous Communications environments.

Available in January 1983, Chameleon with one software package costs $18,000, Tekelec said from Suite 204, 2932 Wilshire Blvd., Santa Monica, Calif. 90403.

Interface Fits Neax-22 PBX

MENLO PARK, Calif. — Instor Corp. has introduced an interface for the Nippon Electric Corp. Neax-22 private branch exchange (PBX) systems and any IBM or other computer.

The Instor 80 is said to write call information for the PBX on 8-in. diskettes. It automatically writes captured call data in the IBM 3741 Basic Data Exchange Standard. With the interface, the PBX can capture data for the generation of reports by date, time, number called, duration of call and cost of call, a vendor spokesman said.

The interface is available for $3,000 from Instor Corp., 175 Jefferson Ave., Menlo Park, Calif. 94025.

Tool Eliminates Modem, Data Set

SASKATOON, Sask. — Develcon Electronics Ltd. has introduced a modem eliminator that may be used instead of a modem or data set when connecting two data terminals together.

The DS541 supports synchronous data at speeds from 1,200 to 19,200 bit/sec and may be operated in full- or half-duplex mode, a vendor spokesman said.

Operation with asynchronous data is strap selectable. Computer controlled digital loopback allows automatic system testing under program control, the vendor spokesman said.

The units are available in desktop or single-channel, rack-mountable modules for $484 from Develcon Electronics, 856 51st St., Saskatoon, Sask., Canada S7K 5C7.

Telex Tools Fit System/34, 38

BURR RIDGE, Ill. — Access Telecommunications has introduced a host-resident software package and a hardware control unit with up to eight I/O ports that is said to allow Telex I and Telex II communications for the IBM System/34 and System/38.

Access/34 and Access/38 provide the means for message switching or interactive file transfer via the Telex I/II communication networks or directly to Telex I/II devices. The systems allow the System/34 and System/38 to handle eight simultaneous Telex I/II transmissions through a single host communications line, a vendor spokesman said.

Prices for the Access systems range from $11,995 to $15,195 and they are available from Access Telecommunications, 60 Shore Drive, Burr Ridge, Ill. 60521.

Security Device Introduced For Data Base Protection

SAN FRANCISCO — A microprocessor-controlled computer security device said to be capable of blocking dial-up data base intruders, masking data base information, eliminating unwarranted tie-up of access ports and giving warnings of unsuccessful dial-up attempts has been introduced by Leemah Telecom, Inc.

The Secure Access Unit (SAU) requires only one phone line per unit and installs at one end only, between the telephone network and modem.

The SAU reportedly answers all incoming calls to the data base and provides a call-back only to authorized locations. The SAU answers a call without an acknowledgement tone and then when it receives the correct Touch-Tone code it emits the acknowledgement tone and disconnects. It then searches its directory to check on the code and if satisfied calls the location back, where the data base can then be accessed by using a one-digit code.

If a valid code is not received, the SAU disconnects whether the caller hangs up or not. If the incoming call comes from an unauthorized site, the call-back can warn of an unsuccessful break-in attempt, LeeMah said.

The SAU is priced at $975 and is immediately available from Leemah Telecom, Inc., 729 Filbert St., San Francisco, Calif. 94133.

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Direct Native-Mode Linkup

IBM Micro, 3270 Get Interface

ATLANTA — Technical Analysis Corp. has introduced an interface for direct native-mode coaxial cable attachment of IBM Personal Computers to IBM 3270 controllers. The interface is a printed-circuit board that is said to fit into any available slot in the IBM Personal Computer, attached via the cable to most IBM 3270 controllers, emulating an IBM 3278 display.

The interface, called Irma, reportedly works with any IBM 3274, 3276 or integral terminal controller that uses Type A terminal adapters designed for Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) and Binary Synchronous Communications (BSC). It provides complete IBM 3278-2 terminal function compatibility and the ability to save full screens of mainframe data on diskette or hard copy, a vendor spokesman said.

The interface's internal 1,920-character screen buffer is maintained and updated by its own microprocessor. It is capable of emulating all IBM 3270 monochrome and color character displays up to 80 columns by 24 lines. It also includes a set of subroutines that can be used for selective transfer of data from the emulated 3278 screens, a vendor spokesman said.

The interface is available for $1,195 from Technical Analysis Corp., 120 W. Wieuca Road, N.E., Atlanta, Ga. 30042.

Microcom Introduces Error-Correcting Modems

NORWOOD, Mass. — Two error-correcting modems said to provide extensive functionality and assure 100% error-free data transfer are available from Microcom, Inc.

The RX/1200 and RX/300 implement a Synchronous Data Link Control-like protocol and include either a Bell 212A or 103 modem. When used as a standard modem, the RX/1200 and RX/300 provide such features as stored telephone number and automatic redial capability, a serial printer port for concurrent printing and the display of received information and the ability to communicate with the terminal or personal computer at speeds up to 9,600 bit/sec.

The RX/1200 costs $895 and the RX/300, $495, Microcrom said from 1400A Providence Highway, Norwood, Mass. 02062.

Data Set Uses CRT Power

SASKATOON, Sask.— Develcon Electronics Ltd. has introduced an asynchronous, limited-distance data set which is said to utilize a power conversion technique to provide data rates from 300 bit/sec to 19.2 bit/sec.

The DS507 is a data set that draws its power directly from the signals presented to it by the connecting terminal rather than using an outside power source.

The "shirt-pocket-size" data set can be plugged into the back of a terminal or directly into a computer port, replacing a standard modem and the power and data cables associated with the modems, a vendor spokesman said.

The data set is available for $98 from Develcon Electronics Ltd., 856 51st St. E., Saskatoon, Sask., Canada 57K 5C7.

Resale Research Report Released on MTS, Wats

RAMSEY, N.J. — The Center for Communications Management, Inc. has introduced its latest special research report on the resale of message telecommunications service (MTS) and Wats.

The "MTS/Wats Resale Survey" identifies the tariff position of the Bell operating companies with respect to resale, the current status of formal investigations/dockets at the state regulatory level and the extent to which existing state laws prohibit and permit resale, according to the firm.

The special research report is available for $75 from the Center for Communications Management, Inc., located at 76 Arch St., Ramsey, N.J. 07446.

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An employee at the Alabama Department of Industrial Relations loads computer-generated tape.

CAR Installation Speeds Unemployment Claims

MONTGOMERY, Ala. — Processing unemployment compensation claims is a lot easier since the installation of a new computer-aided retrieval (CAR) system here at the state of Alabama's Department of Industrial Relations.

In 1980, the department anticipated a logjam in its claims processing. To automate the claims review procedure involving reports from the state's 65,000 employers, it needed to augment the microfilm system in place without changing the medium. It resolved this situation by installing six Intelligent Micro-Image Terminals (IMT-150) from Eastman Kodak Co., which are hooked up to the department's IBM 370/158 system.

Frank Willett, administrative analysis chief in the department, explained that accessing the wage reports is only one step in the process of making monetary determinations on unemployment claims, so reviewers have limited time to access all the microfilmed employers' wage reports necessary for processing all the claims in a given day's batch.

"Our system allows only three hours a day for this step in the process," Willett said. "It was becoming clear that with more and more claims being carried over to the next day, we were going to have to do something."

The purchase of the IMTs has changed all this. "The computer mainframe provides an index to wage report microfilm image addresses on-line to the microimage terminal, which retrieves the desired document image in seconds.

"This has cut our retrieval speed by two-thirds," claimed Willett, attributing the time savings to the downloading capabilities of the microimage terminals. A new computer-microfilm terminal interface allows the retrieval terminals to store an array of index data supplied by the computer in internal memory registers, he said. This downloaded information — collected in large chunks — can then be used to access the necessary microfilm document images. The net result is less operator waiting time between accesses and greater productivity, according to Willett.

"Claimants are getting their determinations — and, if they qualify, their checks — a day sooner than if we had to hold out another day because of slower retrieval of image addresses," Willett said.

Furthermore, Willett projected the con-

(Continued on Page 80)

Alabama claims reviewers refer to microfilmed images of wage documents on Eastman Kodak IMT-150 Micro-Image Terminals.

Compatible With DEC LSI-11 Bus

Processor Card Based on 68000

CAMPBELL, Calif. — A Motorola, Inc. 68000-based processor card compatible with the Digital Equipment Corp. LSI-11 bus has been introduced by Integrated Solutions, Inc. (IS).

The product is an integrated processor on a single quad-size card, with either an 8MHz or 10MHz 68000, a high-speed memory management system that supports demand paging, up to 1M byte of high-speed dynamic memory, up to 32K bytes of read-only memory/erasable programmable read-only memory, two serial ports with programmable transmission rate generation and programmable timer.

The single-unit price for the standard 8MHz IS-68K with 256M bytes of on-board memory is $2,395. For users with smaller memory requirements, a 128M-byte version of the board is available for $2,175. The 10MHz version is available for $2,595 and $2,375, respectively, from Integrated Solutions at 1350 Dell Ave., No. 201, Campbell, Calif. 95008.

FM Turnkey Aids Planning

NEW YORK — A computer-based facilities management and interior space planning system has been unveiled here by Resource Dynamics, Inc.

The Total Facilities Management System is a turnkey product that helps users monitor and control facilities planning, utilization and the resources committed to facilities, the vendor said.

The system's hardware is composed of an alphanumeric CRT terminal; a digitizer tablet; color graphics CRT and keyboard; CPU with 512M bytes of memory, expandable to 1G byte; 20M- to 60M-byte disk file capacity and 12M-byte tape storage; color printer/plotter; and report printer.

The software is made up of two forecasting modules: the Space Planning color graphics display and report module and the Facilities Management and Report Generator module, allowing the creation of drawings that display information on current conditions and future requirements and inventories of space, people, equipment, furniture and real estate.

The system with the above modules costs approximately $140,000 from 655 Madison Ave., New York, N.Y. 10021.

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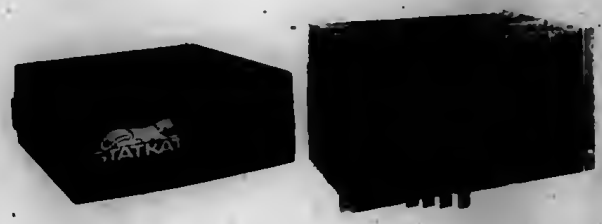

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For Keyscan, Trace II Processors

Image Enhancement Out

DALLAS — Recognition Equipment, Inc. has announced an image processing enhancement for two of its document processors — the Keyscan and Trace II systems.

The image processing capability initially will be interfaced with the Keyscan remittance processing system for wholesale lockbox and general remittance operations in commercial banks and later with the medium-speed Trace II check processing system, the vendor said.

The first installation and test of the Keyscan version is planned for fall 1983 with production system deliveries scheduled for spring 1984. The purchase price of the image system as an enhancement to a Keyscan system is approximately $500,000 to $1,250,000, depending on configuration. The standard Keyscan system currently sells for about $250,000. Both systems can be leased from the firm through P.O. Box 222307, Dallas, Texas 75222.

3M Realigns Disk Pack Line

ST. PAUL, Minn. — 3M's Data Recording Products Division has realigned the top end of its disk pack line with the addition of a third error-free 80M disk pack for Century Data Systems, Inc.'s Trident-type (T-80) drives. This product is designated 947-80C and sells for $530.

Other recent disk additions include the 300M-byte 949-300 B and C and the 80M-byte 949-81 B and C packs. The 100- and 200M-byte 936 series has been renumbered to reflect the error-correction distinction; previously the 947 and existing 949-300 packs had been similarly designated.

3M created the A/B/C suffix grading of disk packs to help users identify the degree of error-free pack needed for each system. For example, C packs reportedly carry the burden for computer systems without error-correction and alternate assignment capabilities.

Further details on 3M's disk pack products are available from the vendor through P.O. Box 33600, St. Paul, Minn. 55133.

Magnuson Offers Lease Buy-Out

SAN JOSE, Calif. — Magnuson Computer Systems, Inc. said it will allow users of leased IBM equipment to apply purchase accruals on their IBM 4331 systems toward the purchase of any Magnuson system of equal or greater power, including Magnuson's 4341-class machines.

The company also announced price reductions of 5% to 28% across the product line.

Magnuson's lease buy-out program offers to help the user pay the lease termination charges on an IBM 4300 if a Magnuson M80 is to be installed. The firm is located at 2902 Orchard Park Way, San Jose, Calif. 95134.

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Cleaning Service Out for Tapes

FORT LEE, N.J. — The Dataguard Division of Novo Communications, Inc. has announced a custom tape cleaning and maintenance service.

The firm's cleaning process reportedly removes 97% of tape debris. The firm uses jeweled blades to hone dust, fingerprints and other foreign matter from tapes.

The service costs about $3/tape in small volumes and about $1.50/tape in large volumes. The firm is located at 2050 Center Ave., Fort Lee, N.J. 07024.

Topaz Unveils Powercenters

SAN DIEGO — Topaz, Inc. has introduced Powercenter Power Distribution Systems for providing noise-free ac power to computers and peripherals.

The Powercenters are said to use flexible, waterfight shielded cables for power distribution in the computer room.

Available in power ratings from 30 kVA to 200 kVA, Powercenters start at $8,850 from Topaz's DPP Division, 3855 Ruffin Road, San Diego, Calif. 92123.

CAR Helps Cut Claims Logjam

(Continued from Page 79)

version to using CAR with the wage reports has saved his department from adding at least six employees.

Having the wage reports on microfilm has given claims reviewers a comprehensive reference. "The primary reference used in making determinations on claims for unemployment compensation is printed wage transcripts," Willett stated.

Any suspect items in the transcripts are resolved by referring to the microfilmed wage report — the complete record of wages filed by each employer for each employee.

The IMT CAR system has significantly streamlined department operations while boosting productivity, according to Willett. Not only does he have no complaints about the system's accomplishments, but he is making plans to expand its use with the addition of more applications.

To Run Bell Labs' Unix

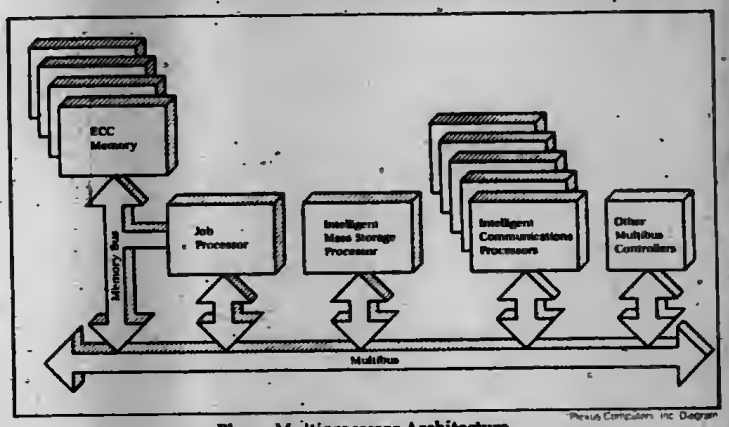
Plexus Unveils MC68000-Based Systems

SANTA CLARA, Calif. — Plexus Computers, Inc. has introduced two hardware systems based on multiple Motorola, Inc. MC68000 microprocessors that are designed to run the Bell Laboratories operating system, Unix. Both systems utilize high-speed cache memory, on-board static random-access memory, memory management hardware, a 32-bit dedicated memory bus and direct memory access.

The P/35 is a 16/32-bit tabletop system that supports up to 16 users. It includes an 8-in. Winchester disk drive and a streaming cartridge tape for backup. The larger P/60 supports up to 40 users, has a main memory expandable to 4M bytes and supports 14-in. Winchester drives.

The machines are said to compete with Digital Equipment Corp. VAX-11 superminis. The P/35 is available for $17,950; the P/60 is available for $42,950.

The company has also announced price cuts of 32% for its Zilog, Inc. Z8000-based P/25 and P/40 Unix-based systems. The systems are also said to have been upgraded in CPU performance. The P/25 now costs $31,950, excluding terminals.



Plexus Multiprocessor Architecture

An eight-user P/40 system, consisting of CPU, 512K bytes of memory, 72M bytes of disk storage and other features is now priced at $37,950, excluding terminals.

More information is available from Plexus Computers, Inc., 2230 Martin Ave., Santa Clara, Calif. 95050.

Multiprocessor Micro System Boasts 120M-Byte Memory

SAN JOSE, Calif. — A multiprocessor microcomputer system boasting 120M-byte memory and 64-user capability has been announced here by Molecular Computer.

The Supermicro 64 is intended for large users such as government agencies and Fortune 1,000 companies requiring a high-performance, modularly designed multiuser system, according to the vendor. The system features an 8- and 16-bit processing capability and is reportedly compatible with all Digital Research, Inc. CP/M and CP/M-86-based application packages.

Each user of the Supermicro 64 has a dedicated processor able to share a common data base and peripherals.

A 16-bit processing capability is provided by an optional AP/86 Performance Accelerator, based on the Intel Corp. 8086 chip, featuring expandable memory from 256K bytes to 1M byte, and it can be accessed by any user, the vendor said.

The AP/86 Application Processors are linked to each other and to the File Processor by a high-speed m/Bus Interprocessor Link. This allows the sharing of a common data base, peripherals and the Performance Accelerator. The m/Bus is a contention bus design, using a protocol called Carrier-Sense Multiple Access with Collision Detection (CSMA/CD).

Disk storage is provided by a 60M-byte formatted 14-in. Winchester disk drive. Up to two disk drives may be connected to the Supermicro 64 for a total capacity of up to 120M bytes.

The basic 60M-byte Supermicro 64 lists for $17,995 and is available for immediate delivery. The vendor is located at 1841 Zanker Road, San Jose, Calif. 95112.

Zenith Lowers Prices 15% On Z/89, Z/90 Processors

GLENVIEW, Ill. — Zenith Data Systems Corp. has lowered prices by about 15% on its line of 8-bit Z/89 and Z/90 processors and related peripherals.

A Z/89 processor with 48K bytes of main memory, built-in display and 5¼-in. disk drive now costs $2,499. Software for the system costs $600.

The basic Z/90 now costs $2,799 including software, the vendor said.

The vendor is located at 1000 Milwaukee Ave., Glenview, Ill. 60025.

Sci-Com Enters Desktop Field With Seiko Series

BRIDGEWATER, N.J. — Sci-Com Computer Systems, a recently formed company that jointly develops, markets, supports and distributes Seiko-built small business computers, has introduced the first in a series of desktop computer systems.

The Seiko Series 8600 is a 16-bit Intel Corp. 8086-based multiuser desktop system offering two single-user and four multiuser operating systems, supporting six standard languages and numerous software applications, the vendor said.

Six operating systems are available for the 8600 including MS-DOS, CP/M-86, Mbos, Oasis-16, Unidol, and MP/M-86, according to Sci-Com. Available applications packages include accounting, word processing, data base management, report generation, screen formatting, business graphics and communications.

The system offers 128K bytes of memory, one 640K-byte diskette, a 10M-byte hard disk with one temrinal and multiuser operating systems software.

Prices for the Model 8600 begin at $5,415, with first shipments scheduled for December 1982 from Sci-Com Computer Systems, 981 Rt. 22, P.O. Box 6050, Bridgewater, N.J. 08807.

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Line of IBM-Compatible Micros Offered

LOS GATOS, Calif. — A line of 16-bit IBM Personal Computer-compatible microcomputers has been introduced here by Eagle Computer, Inc.

At a price of $6,995 and available from December on, the Eagle 1600 series features 128K bytes of random-access memory, 1M byte of disk storage on a 5¼-in. floppy disk drive and 12.5M bytes on a hard disk drive. This gives the system a combined storage capacity of 6,000 pages of double-spaced text, the firm said.

The system's internal memory is expandable to 512K bytes and can accommodate up to eight IBM plug-compatible boards for optional peripherals such as printers, telecommunications devices and color monitors.

Users of the 1600 can select from a range of software including programs designed for the IBM Personal Computer. The package includes word processing and financial planning packages. The company claimed that software availability is further enhanced by networking options. For example, the 1600 series can be linked up with up to 64 Eagle 8-bit or 16-bit microcomputers.

The system costs $6,995 and will be available in December. The firm is located at 501 Vandell Way, Campbell, Calif. 95008.

Printers Debut for Apple II, III

CUPERTINO, Calif. — Apple Computer, Inc. has announced both dot matrix and letter-quality printers for its Apple II and Apple III microcomputers.

The dot matrix printer uses a parallel interface and has a print head life of more than 100 million characters. The unit has a bidirectional print speed of 120 char./sec and permits multiple pitch and proportional spacing. The unit costs $695, the vendor said.

The unit can reportedly print on individual sheets or continuous forms. The printer costs $2,195 from 20525 Mariani Ave., Cupertino, Calif. 95014.

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MTI Micro Introduced, Fits CP/M, CP/M-86

SANTA ANA, Calif. — Microcomputer Technology, Inc. (MTI) has introduced a microcomputer that features dual operating systems for both 8- and 16-bit processing applications. The system is priced at under $2,000.

The Personal Executive Computer is a single-unit station that can run Digital Research, Inc. CP/M and CP/M-86-based software, according to the vendor. It reportedly incorporates both 16- and 8-bit operating systems, allowing access to a long list of application packages, programming languages and software programs. The product features 64K bytes of internal memory and expansion capability to 1M byte, the vendor said. Also included in the base price are two floppy disk drives, 83-key keyboard with numeric key pad and interface ports for video, printer and Winchester hard drive.

Further details on the Personal Executive Computer are available from MTI at 3304 W. MacArthur Blvd., Santa Ana, Calif. 92704.

Winnie Disk, Controller Out

CANOGA PARK, Calif. — Andromeda Systems, Inc. has announced both a Winchester mass storage subsystem and an intelligent graphics controller for Digital Equipment Corp. Q-bus and LSI-11-based systems, respectively.

The Winchester disk, called the Mini Disk System, is available in 5M-, 10M-, 15M- and 20M-byte capacities and is compatible with DEC system software and applications, the vendor said.

The units are fully compatible with DEC LSI-11/2, LSI-11/23 and LSI-11/23 Plus processors. The disk subsystems cost between $3,995 and $5,700.

The intelligent graphics controller, called the VDC11-C, emulates the Tektronix, Inc. 4010 in a graphics mode and DEC's VT52 in an alphanumeric mode, the vendor said.

The unit is packaged on a standard dual-height DEC Q-bus-compatible circuit board and costs $1,700. If integrated into a turnkey graphics terminal, the unit costs $2,200, the vendor said from 9000 Eaton Ave., Canoga Park, Calif. 91304.

'Now My Checkbook Is Balanced and Their Computers Are Unbalanced.'

Tymshare Announces Range Of Micro-Based Services

CUPERTINO, Calif. — Tymshare, Inc. has announced a range of microcomputer-based services including business applications for information management, financial modeling and analysis, data entry and word processing.

Users reportedly can lease a Digital Equipment Corp. microcomputer and applications software, which are compatible with the company's DEC and IBM mainframe-based computer services available through the Tymnet data communications network. Electronic messaging capability, including Tymshare's Ontyme service, will be integrated with the new services, the company said.

The service will be available during the first half of 1983. A Tymshare Professional Workstation I, based on a DEC Rainbow 100 and including operating system, entry point data entry and final-copy word processor, will lease for $300, a spokesman said from 20705 Valley Green Drive, Cupertino, Calif. 95014.

Micros Get Power Aid

ST. PAUL, Minn. — A power system for microcomputers that protects against downtime has been introduced here by Saft America, Inc.

The Standby Power System automatically supplies 200 VA of emergency ac electrical power, at nominal 117V for a minimum of 20 minutes, taking over the job of power supply within one-half cycle of line failure, according to the vendor. In addition, the device reportedly traps and eliminates dangerous spikes and transients in voltage during normal usage.

The power unit is plugged into a power outlet, while the computer devices, including mainframe, terminal and other peripherals, are plugged into the power system's four three-prong outlets, according to a vendor spokesman.

The standard unit, rated at 200 VA, is priced at under $600, the vendor said from 931 Vandalia St., St. Paul, Minn. 55164.

ATS Course Out on 5251

WOODLAND HILLS, Calif. — Automated Training Systems, Inc. (ATS) has announced the System/38 Work Station Operator course.

The course is designed for operators of IBM's 5251 workstation and emphasizes both real-world environments and operator productivity, the vendor said.

The course takes about six hours and costs $195 per copy, the vendor said from Suite 107, 21250 Califa St., Woodland Hills, Calif. 91367.

For Cykey Desktop, Dacs 5000

Floppy, Winnie Subsystems Out

HUNTSVILLE, Ala. — Cybersystems, Inc. has introduced a family of floppy and Winchester disk subsystems for the company's Cykey desktop computer line and its Dacs 5000 industrial-bus microcomputer systems.

The 7300 series of disk subsystems reportedly comes in single- and dual-drive configurations. They are available with one or two 5¼-in. floppy disk drives, one Winchester disk drive or with one floppy and one Winchester.

Floppy disk units are double-sided, double-density drives with an unformatted capacity of 500K bytes. Winchester drives are available in 3.3M-, 6.6M- and 10M-byte unformatted capacities.

Two double-sided, double-density floppies, making up the Model 7312, are priced at $1,297. One floppy and one 6.6M-byte Winchester, in the Model 7341, costs $3,741. One floppy and one 10M-byte Winchester, in the Model 7342, sells for $4,145. The last two include rigid disk controllers.

Additional information is available from Cybersystems at 7540 S. Memorial Pkwy., Huntsville, Ala. 35802.

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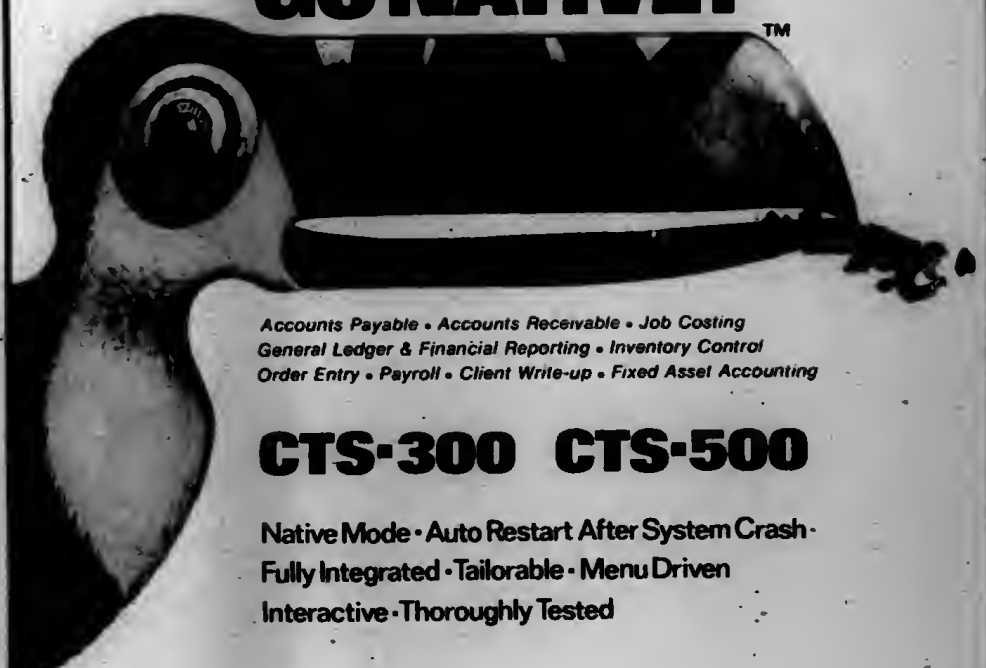

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First Facsimile Device Unveiled

IBM Displaywriter, 5520 Get Disoss

By Bruce Hoard
CW Staff

RYE BROOK, N.Y. — IBM has introduced its first facsimile terminal and enhanced its Distributed Office Support System (Disoss) software to run on the vendor's Displaywriter word processor and 5520 small business systems.

The Scanmaster I facsimile terminal scans images of graphs, printed forms, typed memos and handwritten notes, digitizes and transmits them for printing at individual or multiple Scanmaster I locations. Documents can also be transmitted directly from one of the terminals to another over leased or switched communications lines.

It can reportedly scan or print a page in less than a minute. An automatic document feed allows up to 30 documents in varying lengths of up to 14 in. to be stacked for loading into the machine. It prints on electrostatic paper with a density of about 200 dot/in. horizontally and vertically.

The Scanmaster I is supported by two software packages, the newly enhanced Disoss Version 3 and the Image Distribution System running on IBM 4300 or larger processors. Disoss is a document filing and distribution package. The Image Distribution System operates as an application program under IBM's CICS.

Running Disoss, Scanmaster I is compatible with the Displaywriter, IBM's 8100 distributed processing system and the 5520.

It is available with an integrated modem that transmits at speeds to 4,800 bit/sec. An optional external modem trans-

(Continued on Page 88)

As OA Grows, Security Needs Will Increase, Speaker Says

By Jim Bartimo
CW Staff

BOSTON — Security issues will become more important as organizations become increasingly dependent on office automation, but many offices do not have adequate security systems in place, said Lynn McNulty of the U.S. Department of State.

Speaking at The 1982 International Conference of Wang Users here recently, McNulty said that systems mangers will have to pay closer attention to office security. "We are literally taking people from behind typewriters and making them the managers of sophisticated small-scale systems," he said. "Security and other information management related issues are alien to many of these people."

Managers should establish a security policy which includes periodic monitoring, educating users and establishing accountability procedures. "The objectives of any security plan are secure confidentiality of data and integrity of information," McNulty noted.

Speaking from the perspective of a highly security-conscious department, McNulty identified three categories of security controls:

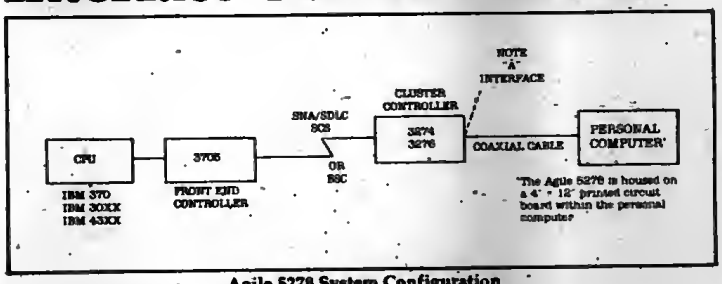
- Physical safeguards used to restrict access and provide protection against fire, water and other disasters.
- Administrative policies and procedures established to enforce proper access.
- Technical safeguards in the hardware and software employed to protect data from accidental or malicious modification, destruction or disclosure.

Security measures should prevent theft

(Continued on Page 90)

Works With IBM 3274, 3276

Interface Out for Micros



Agile 5278 System Configuration

SAN JOSE, Calif. — Agile Corp. is offering low-cost interfaces said to permit personal computer owners to communicate directly with an IBM mainframe computer.

The Model 5278 interface reportedly can be used by anyone with an IBM Model 3274 or 3276 cluster terminal controller. It is said to connect Apple Computer, Inc.'s Apple II and Apple III, Radio Shack's TRS-80, Hewlett-Packard Co.'s HP 125 and the ET180 and PC100 personal computers from Digital Equipment Corp. to IBM mainframes.

The product appears as a 3278 to the mainframe. It allows pseudo-batch-mode processing and distributed processing to be accomplished by the host computer, the vendor said.

Actual operation of the personal computer with the 5278 interface is similar to normal IBM 3278 operation, according to the vendor.

Necessary allowances have been made for the dissimilarity of keyboards and CRT screen size. Required special-function keys are indicated by the product's keyboard overlay to provide the information required by the personal computer's operator.

The Model 5278 interface costs $1,595, Agile said from 1441 Oak St., Eugene, Ore. 97401.

Daisywheel Printer for WP Released

GARDENA, Calif. — A 16- to 20 char./sec daisywheel printer designed for word processing applications has been introduced by Brother Industries, Ltd.

The HR-I Daisy Wheel Printer features bidirectional printing and a cassette-type daisywheel and ribbon, according to the vendor. The unit interfaces with Qume Corp. Sprint 3, RS-232C and Centronics Data Computer Corp. parallel interfaces, the vendor said.

For Centronics parallel versions, the cost is $1,150; for RS-232C versions, the price is $1,250. Distribution is through Dynax, Inc., 16404 Ishida Ave., Gardena, Calif. 90248.

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The Televideo Model 925 offers ergonomic design, detachable keyboard and editing capabilities. The 950 adds programmable keyfunctions. Choose the basic Model 910 for maximum economy. All models feature Televideo's eye-easy green phosphor screens. The number to call is 800-447-4700. In Illinois, call 800-322-4400. In Canada, call 1-800-268-6923.

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Said to Increase WP Capabilities

Astra Line Gets Version of WP Aid

LEXINGTON, Mass. — A new version of its word processing software package for its Astra series of business computer systems has been introduced by NEC Information Systems, Inc.

The software release incorporates many advanced features said to increase substantially the capabilities of the Astra as a full-featured word processing system. These include the ability to reformat text automatically on the operator's screen, set up a variety of different format lines within a single document, indent any number of lines by setting a single tab and determine automatically page breaks and page ends.

Other enhancements include deletion and insertion of characters through simple overstriking and simultaneous print and edit capabilities, the vendor said.

Astra Word Processing is available on all models of the Astra series, which ranges in size from the desktop Model 200 to the 16-operator Station 270. Astra Word Processing is priced at $2,000 and is available immediately from NEC Information Systems, at 5 Militia Drive, Lexington, Mass. 02173.

Guide Covers IBM Micro Offerings

BOCA RATON, Fla. — IBM has published the first edition of "The Guide to Personal Computer Offerings from IBM," an 84-page, illustrated description of IBM Personal Computer features, functions and capabilities.

Contents cover system hardware, service options and software products, including business, professional/personal and education programs, as well as operating systems and languages.

The guide is available through authorized IBM Personal Computer dealers; the cover price is $3.

Line Printer Out for Series IV

CUPERTINO, Calif. — Four-Phase Computer Systems, Inc. has introduced a high-speed line printer for use with its Series IV product line.

Model 8158 is a solid-font impact band printer that prints 1,200 line/min using a standard 64-char. band or 850 line/min with an optional 96-char. band. It is a full-width, 132-col. printer. Print format is 10 char./in with vertical line spacing switch-selectable to either six or eight line/in.

Standard features of the 8158 include a touch control panel that provides visual and auditory confirmation of switch contact and a diagnostic panel that displays any malfunction automatically.

The printer can be leased for $980/mo based on a 42-mo lease or purchased for $52,000. Maintenance is $370/mo. It is available from Four-Phase at 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

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CW1182

IBM Adds Fax, Enhances Disoss

(Continued from Page 87)

mits at up to 9,600 bit/sec.

There are three Scanmaster I models, ranging in price from $11,880 to $14,880.

In addition to supporting Scanmaster I, Disoss Version 3 now supports Displaywriter and 5520 workstations in addition to the 8100's Distributed Office Support Facility (Dosf) package.

For Displaywriter, it supports document filing, research, retrieval and distribution functions. For the 5520, Disoss Versions 2 and 3 both support document filing, search, retrieval and printing. With Version 3, documents can be interchanged among Dosf/8100 and Displaywriter users.

It also includes the Application Program Interface (API), a host facility that allows user-written CICS applications to access Disoss document-related functions.

General availability of Version 3 is scheduled for October 1983 for an initial license charge of $4,000 for OS/MVS operating system users and $1,500 for DOS/VSE users. On a monthly basis, it costs $1,300 for OS/MVS and $500 for DOS/VSE.

IBM also announced 17% to 33% price reductions for the 5520. It will support attachment to Disoss Version 2 in May 1983 and Version 3 in October 1983 via a Systems Network Architecture (SNA) connection.

Other 5520 enhancements announced include 5520-IBM Personal Computer compatability for July 1983 and U.S. or UK English dictionary support, also during July 1983.

Other announcements included:

- Enhancements to the Professional Office System (Profs) software package.
- A new entry-assist facility for the 3274 control unit.
- Software supporting Displaywriter attachment to Disoss Version 3, via SNA.

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Business Graphics Package Announced for IBM Micro

CAMBRIDGE, Mass. — A business graphics package for the IBM Personal Computer has been announced by Business & Professional Software, Inc. (BPS).

Called BPS Business Graphics, it enables Personal Computer users to create a variety of multicolor charts and graphs using English-language commands. Data for the graphs may be entered directly from the keyboard or extracted from Visicorp's Visicalc and Sorcim Corp.'s Supercalc models, accounting reports and word processing documents.

BPS Business Graphics can create graphics formats that include lines, horizontal and vertical bars, multiple bars (up to four sets), pies, partial pies, areas, points and any combination of these on the same axes. Users can create horizontal and vertical grid lines as well.

Hardware requirements for BPS Business Graphics include an IBM Personal Computer equipped with 128K bytes of main memory, two disk drives, a color graphics adapter and a standard video monitor.

The package has a suggested retail price of $350 and will be available in January. More information is available from BPS at 143 Binney St., Cambridge, Mass. 02142.

Wangnet Versions Offered

LOWELL, Mass. — Wang Laboratories, Inc. has unveiled smaller, larger and expanded versions of Wangnet, its broadband local-area network.

Wangnet cable kits will offer a reduced-scale turnkey networking configuration, while the span for the larger Wangnet configurations has been expanded to serve multibuilding environments, Wang said. In addition, the number of channels used to support non-Wang systems and terminal attachments has been increased.

Wangnet cable kits allow for the attachment of the same Wangnet interface devices (acquired separately) as the full-distribution Wangnet network.

The kits vary in size from the small four-outlet model that can span 120 feet to the large 20-outlet kit that can span 260 feet. The smallest configuration, Wnkit 4-H, includes four 60-ft drop cables with Wangnet outlets for attachment of up to four Wangnet interface devices. It costs $1,350 with PCV cable and $2,400 with Teflon cable. The larger Wnkit 12-70, consisting of 12 60-ft drop cables allowing for the attachment of 12 devices, can span a maximum of 260 feet from outlet to outlet. It costs $3,350 with PCV cable and $7,050 with Teflon. The Wnkit 20-35, which also spans 260 feet, allows for the attachment of 20 interface devices. An extra 25 feet of cable may be added to each unit to connect the interface device to the outlet. It costs $4,150 with PCV cable and $10,000 with Teflon.

Wang also announced a doubling — from 32 to 64 — of the available channels in the interconnect band for Wang and non-Wang system attachments. The company also said Wangnet can cover a multibuilding environment in excess of four miles. Wang is located at 1 Industrial Ave., Lowell, Mass. 01851.

WP Package Out For Unix

SAN FRANCISCO — Horizon Software Systems, Inc. has introduced a word processing software package for use with the Bell Laboratories Unix operating system and "look-alike" operating systems.

Horizon Word Processing is said to offer easy document creation, full-screen editing, complete formatting and document management. All functions needed to edit, format, expand, delete, merge, recall, display and print a text are also included. Embedded commands provide extended capabilities including justification, automatic hyphenation, running headers and footers, footnotes and typesetting.

A single copy of the package is available for $750 from Horizon Software Systems, 220 Downey St., San Francisco, Calif. 94117.

Security Needs Grow With OA

(Continued from Page 87)

as locks do, detect theft as software monitoring systems do, minimize disaster as fire protection systems do and recover as backup systems do.

CPUs and disk storage units are often found in unsecured areas or in paper-filled closets where fire is a hazard. Magnetic media is often mishandled as are used multistrike daisywheel typewriter ribbons. When placed under a microscope, the ribbons can be read, McNulty said. "With the growth of the home computer market, there will also be office supplies' thefts," he said.

Many organizations have no administrative procedures to ensure that the system is being used for the company's purposes only. McNulty told of one company that was planning to add CPUs to its office system until the management decided to print out everything on it.

"The first thing they did was fire one person for running a service bureau," McNulty said. The company found that it needed to cut back instead of add CPUs. "People are running Little League batting averages, Christmas card lists and bowling averages on these systems."

System safeguards should include access controls, file security and a system that will record how much time a user has spent on the system. Other systems should monitor how many tries a user makes in inputting a password to alert managers of attempted break-ins, McNulty explained. "The kids going to computer camp today are your system penetrators of tomorrow."

Semi Co-op Makes First Awards For Research

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Semiconductor Research Corp. (SRC), the cooperative research financing organization formed earlier this year by 13 major U.S. electronics firms, has awarded its first eight university contracts.

Cornell University will receive just under $1 million to support the first year's work of 18 faculty members and the same number of graduate students in the area of micro science and technology. The University of California at Berkeley and Carnegie-Mellon University will receive a total of $1.75 million for research in computer-aided design of integrated circuits, SRC officials said at a recent press conference.

The awards are part of the SRC plan to establish "centers of excellence" in semiconductor research, according to SRC Executive Director Larry W. Sumney. The organization hopes to develop eight to 10 such centers around universities in the next two to three years.

Sumney said the SRC plans to help create from these centers several "super centers" by 1984 or 1985 that will share research facilities, management and

(Continued on Page 94)

Magnuson Resuscitated As Investors Purchase 51%

By Bill Laberis
CW Staff

SAN JOSE, Calif. — A group of private investors has purchased controlling interest in financially troubled Magnuson Computer Systems, Inc., signaling what one company official termed "a new day and a new future."

That future, however, may well depend upon how accurately Magnuson's management team has measured past mistakes in charting a new course for the plug-compatible manufacturer (PCM), according to industry analysts.

The investors, led by Hambrecht & Quist of San Francisco, now own 51% of Magnuson after having paid $2.3 million to buy the company's $21 million secured loan from the Bank of America. Hambrecht also paid $1 million to retire the company's trade-creditor debt.

In turn, Hambrecht converted $15 million of the loan to five million company shares, with Bank of America retaining two million shares of Magnuson common stock, officials said.

Acknowledging that financial matters at Magnuson "are still pretty tight," Robert N. Stephens, vice-president of administration, said management will work to match revenues with operating expenses in order to stanch a fiscal hemorrhage that has plagued the company with consecutive quarters of losses.

Trouble Started Last Year

Magnuson's rapid rise within the PCM ranks came to an abrupt halt in 1981, the same year Datapro Research Corp. rated Magnuson's mainframes No. 1 in overall user satisfaction. Magnuson closed the year losing $36.6 million on revenues of only $27 million, with $31 million in losses coming in the fourth quarter alone.

"Yeah, there were a lot of problems then, and one of them was that management was spending far too much time on the recapitalization matter, especially the Storage Tech thing," said Stephens, alluding to the collapse of Magnuson's proposed acquisition by Storage Technology Corp. (STC) last January.

Stephens also alluded to a lack of coherent direction from Magnuson's former management team, virtually all of whom have been replaced within the last 12 months. He also said that Joseph Hitt, the company's former president and chief executive officer, "tried hard to deal with an impossible situation in which the company grew too fast and perhaps in too many

(Continued on Page 92)

IBM, Burroughs Committed to Boscom

By Paul Gillin
CW Staff

BOSTON — IBM and Burroughs Corp. are among more than 60 vendors that have committed to maintaining permanent showrooms in a new computer market center to be built here.

The center, called Boscom, is scheduled to open in early 1984, about the same time as Infomart, a computer marketing center in Dallas. A smaller full-time computer exhibit center called Computerama 21 is set to open in Atlantic City, N.J., in March 1983.

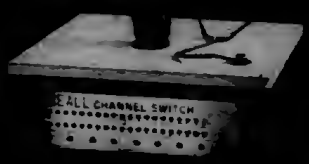
Boscom reportedly will serve as a convention center and permanent showroom with the capability of supporting a convention, a users group meeting and more than 615,000 sq ft of exhibit space, according to the developer, FMR Properties, a subsidiary of the Fidelity Group. The center will be located in a 1.4 million sq-ft former warehouse on the Boston waterfront and will include 114,000 sq ft of temporary exhibit space, a 94,000 sq-ft main exhibition hall and 100,000 sq ft of space for guest services.

The spokesman said that eight professional associations have committed to holding annual conferences at Boscom.

(Continued on Page 92)

Architectural Model of the Boscom Facility

Instant Cure for Computer Indigestion



John Beall & Company, Inc.

Magnuson Sees 'New Future' With Investor Aid

(Continued from Page 91)

different directions at once."

Without yielding much detail about the company's new recovery course, Stephens said Magnuson will be looking to involve itself in joint systems ventures, while attempting to market bulk processor sales. STC's Ultimacc Systems, Inc.'s new IBM-compatible processor, announced this month, is based on Magnuson's M/80/30 series processors [CW, Nov. 8].

"We'll be looking to get into more deals like that one," Stephens said of Ultimacc.

Otherwise, Stephens said, Magnuson is not actively talking merger or acquisition with any other company. "And that includes Burroughs Corp.," Stephens said of persistent rumors to the contrary. Stephens concluded by saying he believes Magnuson can be operating in the black by as early as the second quarter of 1983.

While agreeing that the Hambrecht deal could bode well for Magnuson, industry analyst Jack Hart of International Data Corp. of Framingham, Mass., warned that the rules of the PCM game have changed appreciably in the last 12 months. Most notably, IBM is more willing than ever "to wheel and deal for business in the low-end mainframe market."

"The question is, can anyone really compete with IBM in that segment of the market?" Hart said.

Hart claimed that many of Magnuson's early successes in the PCM market came as a result of IBM's "not seeming to mind if companies like Magnuson chipped off a piece of the market here and there."

"That's all changed, at least since the settlement of the U.S. government's antitrust suit against IBM," Hart said, adding that Magnuson's participation in joint research and production ventures "might be the wisest course of action now."

Hart cautioned that some of Magnuson's old customers may come to feel "they're betting on the wrong horse" in staying with Magnuson, but he said these same customers have been well satisfied with Magnuson's products to date.

Boscom Gets Commitment

(Continued from Page 91)

Coincident with the Boscom announcement, the Dallas Market Center announced that it has received commitments from more than 40 vendors to lease space in its Infomart market center. The center is said to include 1 million sq ft of exhibit and meeting space along with 120,000 sq ft of temporary exhibit space and a 202,000 sq-ft exhibit hall.

Among the vendors who have signed agreements are Burroughs Corp., Fujitsu, Ltd., Honeywell, Inc., Intel Corp., McCormack & Dodge Corp. and Texas Instruments, Inc.

The developer also announced that Infomart will sponsor a dozen educational seminars in its first year of operation geared toward specific businesses and technologies.

The smaller scale Computerama 21 in Atlantic City will feature permanent exhibits by more than 30 vendors, according to the developer, Halmar Associates. Approximately 4,000 sq ft of exhibit space will be available, a spokesman said.

The slew of recent computer market center announcements reflects a vendor shift toward low-pressure marketing tactics, according to Ellen Levin, a product manager in Micro Systems Marketing Services with the International Data Corp.

"A lot of users are new to the market and they don't want a real tough sell," she said. "The personal computer market will be a matter of the user going to the company. The whole thing is coming to be more like a commodity market."

Levin said DP managers are not likely to see significant benefits from the market centers unless they have an in-house personal computing environment.

Intel Stops Wage Hikes, Cuts Some Salaries

By Bill Laberis
CW Staff

SANTA CLARA, Calif. — Recessionary aftershocks continued to ripple throughout the semiconductor industry as Intel Corp. recently announced an across-the-board wage freeze and salary cuts beginning Jan. 1.

The salaries of many of Intel's 20,000 employees worldwide, from line assemblers to top executives, will be reduced on a graduated scale, with no reduction for employees earning $750/mo and less to 10% reductions for those earning $2,750 or more per month. The wage freeze will affect all employees throughout 1983, Intel said.

Intel's austerity moves, which will save the company about $20 million next year, are designed to spare employees the mass layoffs that have rocked Intel's domestic competitors, a spokeswoman said. Texas Instruments, Inc. and National Semiconductor Corp. have laid off over 3,000 workers between them in the past year.

The wage freeze and salary cuts at Intel followed a bleak third-quarter financial report, in which the company's profits dipped 23% to $8.4 million or 18 cents per share, down from profits of $11 million the same quarter a year ago. Intel expects its fourth-quarter profit results to be no better if not worse than those of the third quarter. Meanwhile, revenues grew nearly 18% in the third quarter to $237 million, Intel said.

"We're really at a marginal profit level at this time, and we need to do something about it," a spokesman said.

The U.S. semiconductor industry has been particularly hard hit by recessionary price erosion, due in part to intense competition from Japanese manufacturers.

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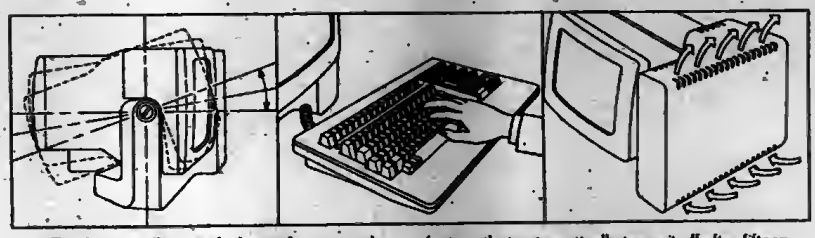

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Tandem Sets Wage Freeze, Short Layoff

By Robert Batt
CW West Coast Bureau

CUPERTINO, Calif. — Tandem Computers, Inc., has announced a series of cost-cutting measures designed to improve profit margins.

The measures include a 2½-day "unpaid vacation" for all employees this month and a freeze on salaries at current levels. Tandem will also restrict the hiring of new employees to customer support and sales-related areas.

Announcing the decision, James Treybig, company president and chief executive officer, said, "The unpaid vacation, along with other cost-cutting measures, are being taken to improve the company's operating profit margins, which fell below corporate goals for the fiscal quarter ended September 30, 1982."

In the most recent quarter, Tandem's revenues totaled $91 million, an increase of 41% over last year's $64 million quarterly results. Net income in the same period rose to $9.5 million or 24 cents per share, compared with profits of $8.2 million or 21 cents per share last year. Pretax operating margins climbed by 14.2%, off the 16% to 20% target the company had set.

Expenses Focus

Following Treybig's announcement, a company spokeswoman said, "What we are focusing on is the relationship between revenues and expenses. While demand for our products is growing, our expenses are outstripping revenues. These measures are necessary if we are to be financially strong."

The company said that the softening demand for computer products in heavy manufacturing areas such as Canada and the Midwestern states has adversely affected company finances. "People are not investing as heavily in capital goods as hitherto and we must take this into consideration when planning our financial strategy," the spokeswoman added.

She said further cost-cutting measures will depend on how long it takes to get expenses into line with revenue growth.

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SRC Awards First Contracts

(Continued from Page 91)

administration.

Present SRC members are Advanced Micro Devices, Inc., Control Data Corp., Digital Equipment Corp., E-Systems, General Instrument Corp., Hewlett-Packard Co., Honeywell, Inc., IBM, Intel Corp., Monolithic Memories, Inc., Motorola, Inc., National Semiconductor Corp. and Silicon Systems, Inc.

Incorporated in May, SRC is a nonprofit organization that supports semiconductor research for the benefit of industry and to foster development of research facilities, primarily within universities, that will attract graduate students and faculty. SRC member companies will obtain the rights to the research findings, which will also be available for licensing by other firms, according to SRC Chairman Erich Bloch, an IBM vice-president [CW, April 19].

Sumney said the SRC budget for research contracts will be approximately $6 million in 1983, rising to $15 million to $20 million in 1986 and perhaps reaching $30 million to $40 million in later years. The organization is seeking other firms for membership, Bloch added, suggesting that money from new members plus the increasing revenues of the semiconductor industry should provide additional funds in future years.

Avoiding Duplication

The SRC is working with the Defense Department to make sure the corporation does not duplicate the work of the ambitious Defense Very High Speed Integrated Circuit (VHSIC) program, Sumney said. Likewise, the organization confers with the National Science Foundation to ensure that the research activities of the two are complementary, Sumney said.

Sumney further stated that SRC has picked approximately 25 research proposals from more than 150 already submitted by 52 universities for funding. Additional contracts will be awarded during the next several months.

Besides developing the research centers, the SRC will support individual professors and universities based on proposals solicited by SRC and for what Sumney called "new thrusts" in research generated by need, opportunity, responses to proposal solicitations and unsolicited proposals.

The initial group of contract awards announced here also included five smaller research proposals:

- Stanford University, Prof. Fabian Pease, $116,506 for "performance enhancement of very large-scale integration [VLSI] through the use of advanced cooling techniques."
- University of Minnesota, Prof. Gary Y. Robinson, $73,00 for "low resistance ohmic contacts for VLSI technology."
- Mississippi State University, Prof. Thomas E. Wade, $109,815 for "investigation of multilevel interconnection and reactive ion beam source for VLSI applications."
- University of North Carolina, Prof. F. Brooks, $80,475 for "transfer of software methodology to VLSI design."
- University of Illinois, Prof. J.E. Greene, $99,973 for "thermal and accelerated dopant/surface interactions during vapor phase growth in VLSI device fabrication."

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Choice #2, $495*— the newest addition to the UDS family of line-powered modems is the 212LP. It is Bell 212-compatible at 1200 bps only (many applications never utilize the 300 bps channel), is certified for direct connection to the dial-up network and requires no AC power connection. Operating energy is derived entirely from the telephone circuit.

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Studies Predict Data Communications Growth

By Paul Gillin
CW Staff

Rapid growth in the area of data communications is likely to occur over the next five years, according to three recent market reports.

A study titled *Modems and Multiplexers* from Creative Strategies International, Inc. (CSI) forecasts that the worldwide modem market will increase from $1.2 billion in 1981 to $3.4 billion in 1990, a 13.9% annual growth rate. Further, the study predicts that statistical multiplexers will lead the multiplexer market to a 14.4% annual growth and $1.1 billion in annual sales by 1990.

The Carterfone Decision of 1968, which effectively stripped the Bell system of its monopoly on public telephone equipment, has led to a large influx of competitors in the data communications market, the study said. Although large companies will continue to swallow smaller ones, the market will become increasingly competitive.

The study costs $1,450 from CSI, located at Suite 27S, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

An even brighter market picture is painted in another study by Frost & Sullivan, Inc. Called *Modems, Multiplexers and Concentrators: Technology and Markets*, the study predicted an annual market growth of 35% through 1985 in the data communications industry.

The time division share of the multiplexer market will grow to nearly 100% by 1990, the report concluded. Two major trends will characterize the markets for modems, multiplexers and concentrators: higher speed transmission and integrated systems. International markets are prepared for a steep growth period as soon as a vendor decides to cultivate them, the study said. And by 1990, it will be virtually impossible to distinguish between the traditional data processing and data communications industries.

The 160-page report costs $1,150 from Frost & Sullivan at 106 Fulton St., New York, N.Y. 10038.

The low-end multiplexer market is likely to lead all communications devices with a growth rate of 51% per year through 1986, according to a study titled *Data Communications Equipment Markets*, from International Data Corp (IDC). Overall, the report estimated the market for modems, multiplexers and communications processors will grow 22% during that period.

AT&T deregulation will lead to a competitive struggle, with that company and IBM likely to emerge as the dominant forces in the industry by 1990, the report concluded. Modems will experience a healthy growth rate, despite some early uncertainty due to the expected popularity of AT&T's Dataphone Digital Service, the study said. The fastest growth will be in the 1200 bit/sec segment, at 25% per year.

The report costs $3,500 from IDC at 5 Speen St., Framingham, Mass. 01701.

Local-Area Market to Skyrocket; IDC says

FRAMINGHAM, Mass. — The market for local-area networks will be one of the fastest growing in the computer industry over the next five years, according to a report published by International Data Corp. (IDC) here.

With installations growing at a compound rate of 28.6% annually, the installed local-area network base will be more than four times as large in 1986 as it was in 1981, the report predicts. The most significant growth will be in broadband systems, which the survey predicts will grow at an annual rate of 37.1%.

Enthusiastic user interest, declining equipment cost, rising local telephone rates and a proliferation of distributed systems will be significant factors in the surge, according to the report.

As a result, the list of local-area network vendors has expanded from six in 1981 to 45 today. The future market will be large enough to accommodate several new vendors including computer systems vendors, component suppliers and local-area network systems vendors, the IDC report maintains.

However, major new technologies have not matured sufficiently to indicate in which direction the market will go, the study notes. Also, the question of standardization must be addressed before local-area networks will achieve universal acceptance.

Entitled "Local Area Networks: Markets and Trends," the 110-page report examines the current local-area network market and predicts future trends. A six-year market forecast is included.

Major new technologies examined and compared include the central computer (Xerox Corp.'s Star) network, the private branch exchange, bus vs. ring, cable vs. fiber optics, carrier-sense multiple access/collision detection vs. token passing and baseband vs. broadband.

The report costs $3,500 from the IDC Corporate Planning Service Program at 5 Speen St., Framingham, Mass. 01701.

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Earnings Slide 3% For '82 at M/A-COM

BURLINGTON, Mass. — Orders and sales both posted gains in fiscal 1982, but the bottom line at M/A-COM, Inc. showed a 3% earnings slide from 1981, the company reported.

Net income from continuing operations for the year was $41.2 million or $1.07 per share, compared with profits of $42.5 million or $1.11 per share in 1981. Revenues, on the other hand, rose 18% in 1982 to $588 million, up from $498 million the previous year.

Richard T. DiBona, company president and chief executive officer, said M/A-COM's earnings have been hurt by recessionary backlash, increased research and development investments and pricing pressures in the cable and components portions of the company's business.

Other Notes

Denelcor, Inc. has recently completed a private placement of 325,000 shares of common stock with a small group of investors for approximately $2.1 million.

$ $ $

Cullinane Database Systems, Inc. has announced plans for a public offering of 550,000 shares of common stock in late November.

$ $ $

Management Science America, Inc. has declared a two-for-one stock split in the form of a stock dividend.

$ $ $

Advanced Systems, Inc. has extended the expiration date of its offer to exchange Series A $3.50 convertible preferred stock for common stock, to Nov. 30, 1982.

$ $ $

NBI, Inc. has filed a registration statement with the Securities and Exchange Commission for a public offering of $40 million in convertible subordinated debentures due in the year 2007. The offering will be managed by Blyth Eastman Paine Webber, Inc., and Hambrecht & Quist.

$ $ $

Adaptec, Inc., Milpitas, Calif., has secured second-round funding of $2.65 million from Lawrence, WPG Partners, San Francisco; Technology Venture Investors, Menlo Park, Calif.; New Enterprise Associates, San Francisco; and Merrill, Pickard, Anderson & Eyre, San Francisco.

$ $ $

The board of directors of **Timeplex, Inc.** have authorized a five-for-four stock split of its common stock in the form of a $25 stock distribution, to be issued Dec. 15. Cash payments will be made in lieu of fractional interests.

$ $ $

Olivetti, C.S.p.A. has acquired 48.8% of the voting stock of The Phoenix Group, Inc., the parent corporation of Microage Computer Stores. The $2.5 million venture investment was made through Olivetti's subsidiary, Olivetti Realty N.V.

$ $ $

Solosystems, Inc. has received $2.2 million in venture financing. Investors include Bay Partners, Mountain View, Calif.; Hambrecht & Quist, San Francisco; Harvest Ventures, New York and a number of private individuals in California.

$ $ $

Dean Whitter Reynolds, Inc., Rothschild, Inc., and Hambrecht & Quist have announced the public offering of 1.25 million shares of common stock of **Monolithic Memories, Inc.** at $21 a share.

$ $ $

Comdisco, Inc.'s board of directors has also authorized the redemption of all of its 13% convertible subordinated debentures, due 2001, at $1,117 for each $1,000 principal amount, plus accrued interest to the redemption date.

$ $ $

Computer Memories, Inc. plans an underwritten public offering of common stock following its recent three-for-two stock split. The firm will offer 600,000 shares with an additional 300,000 shares being offered by selling shareholders.

$ $ $

The board of directors of **Verbatim Corp.**, Sunnyvale, Calif., has approved a two-for-one stock split, increasing the outstanding number of Verbatim shares from approximately 5.25 million to 10.5 million.

$ $ $

Informatics General Corp. has filed a registration statement with the Securities and Exchange Commission for a proposed public offering of 750,000 shares of common stock. Smith Barney, Harris Upham & Co., and Alex, Brown & Sons will manage the underwriting group.

$ $ $

Concord Data Systems, Inc. has completed its second round of financing. A consortium of investors including Vista Ventures and Fairfield Venture Management of Stamford, Conn., and Fleet Venture Resources, Providence, R.I., The Orange Nassau Companies, TA Associates, Boston University, Pioneer Capital and The First National Bank, all of Boston, Mass., currently hold equity in Concord Data of approximately $3.9 million.

Report to Cover Chinese Market

HONG KONG — International Data Corp. (IDC) Asia Limited is offering a newsletter that provides business and market intelligence for the computer systems and software market in the People's Republic of China.

The *EDP China Report* will reportedly focus on such topics as China's efforts to catch up with advanced computer technology; China's commercial link with Western companies in computers, electronics and telecommunications; China's production of computers and associated equipment; reports on opportunities to bid on computer purchase requirements in China; user needs and computer planning in China; and trends and import/export news.

The report costs $250 per year with a sample copy available from IDC Asia Limited, 11/F, Goshen Mansion, 177 Gloucester Road, Hong Kong.

Venture Capital Fair Unites Ideas With Financial Backing

NEWTON, Mass. — The Massachusetts Department of Commerce hosted a unique forum that brought 17 Massachusetts firms with something to sell together with 31 venture capitalists armed with sharp pencils when the Venture Capital Fair '82 was held here recently.

"We felt it might be valuable for people to meet face to face to discuss new business opportunities," said Karen Ernst, the department's director of public information.

Each firm made a 10-minute presentation to the assembly in the morning, followed by small group sessions and demonstrations in hotel suites in the afternoon. Eleven of the 17 enterprises were high-technology firms, specializing in hardware, software and services; four of the 11 were involved in some aspect of graphics, electronic page makeup or electronic publishing.

"The information industry is the growth area," said David H. Goodstein, director of Inter/Consult, a firm specializing in text and type automation. "Ninety percent of the business world will be reading electronically produced pages of one form or another by 1990." Goodstein said he attended the fair searching for venture capital to support a new type of decision support system that his firm has developed.

"I think it's a great idea so long as things don't get too competitive," said one venture capitalist. "You get a better sense of the product or company when the person presents it." More fairs are in the offing; further information can be obtained from Karen Ernst or Jim Keeney at the Massachusetts Department of Commerce, 100 Cambridge St., Boston, Mass. 02202.

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New Companies

Hitech Consulting Group, Inc. is a new firm providing a wide range of consulting services. Initial emphasis will be on executive searching for U.S. and European high-technology organizations. Hitech is a subsidiary of Groupe Informa, a European information processing services firm headquartered in Paris. It is located at Suite 1140, 1801 Ave. of the Stars, Los Angeles, Calif. 90067.

Phaze Information Machines Corp. is a firm that will design, manufacture and market IBM-compatible computer display stations and data processing products. Founded by two former ITT Courier Terminal Systems, Inc. executives, the firm has established engineering and marketing offices at 7650 E. Redfield Road, Scottsdale, Ariz.

Micro-Ed is a firm offering microcomputer education and training to executives, computer professionals and educators. The company is located at 31 Marshall Drive, Edison, N.J. 08817.

Lloyd/Harvey Corp. specializes in software packages for management information systems. The firm is located at Suite 100, 18219 Delano St., Reseda, Calif. 91335.

Nuco Systems, Inc. provides on-line DP services for property/casualty insurance, employee benefits claims administration and workers compensation claims processing. A summary of the firm's data services is available from 430 W. Roosevelt Road, Wheaton, Ill. 60187.

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DATA GENERAL FILLS THE MAJOR GAPS IN WANG'S COMPLETE OFFICE AUTOMATION SYSTEM.

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ELECTRONIC FILING	YES	YES	YES
CALENDAR & SCHEDULING	YES	PROMISED	YES
ELECTRONIC MAIL	YES	YES	YES
PHONE MESSAGING	YES	PROMISED	YES
INTERRUPT	YES	NO	NO
SNA	YES	PROMISED	NO
X.25 NETWORKING	YES	NO	NO
LOCAL AREA NETWORKING	YES	YES	YES
REMOTE DATABASE ACCESS	YES	YES	NO
DBMS	YES	PROMISED & WITHDRAWN	NO
CINCOM TOTAL*	YES	YES	NO
QUERY WITH GRAPHICS	YES	PROMISED	NO
APL	YES	NO	NO
ANSI PL/I	YES	YES	NO
ANSI COBOL	YES	YES	NO
BASIC	YES	YES	YES
RPG	YES	YES	NO
FORTRAN	YES	YES	NO
PASCAL	YES	NO	NO

* Chart based on trade press articles, Wang literature, industry reporting publications, and data supplied by industry reporting services. CEO and ECLIPSE are trademarks of Data General. TOTAL is a U.S. registered trademark of Cincom Systems, Inc. ALLIANCE is a trademark of Wang Laboratories, Inc.

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Which means users can instantly send information from one person to another, one department to another, or one office to another—whether it's across the hall or across the continent.

The result is a system so comprehensive, the editors of Electronic Message and Mail Systems said: "Data General's move into the office was not a promise...Plainly stated, Data General waited until it had a complete system before announcing any part of it." And it has the added advantage of being deliverable now.

For an in-depth evaluation of this chart, take it to your office-systems expert, or contact us directly at 4400 Computer Dr., Westboro, MA 01580, Attn: CEO 24. We'll be happy to provide information on our MV/6000 and MV/8000 based CEO systems as well.

You'll discover Data General has two advantages over Wang's complete office automation system:

It's complete. And it's a system.

Data General

Supershorts

Kidde, Inc., Clifton, N.J., is combining its Victor Business Products subsidiary with Sirius Systems Technology, Inc. of Scotts Valley, Calif., to form a new business microcomputer company, Victor, Inc. Chuck Peddle, president of the new firm, had been president of Sirius. Fred R. Sullivan, chairman of Kidde, will also serve as chairman of the board of Victor.

The Sorbus Service Division of Management Assistance, Inc. said it has become the first national third-party computer maintenance company to offer both on-site and carry-in service repair services for IBM Personal Computers and their plug-compatible peripherals.

— — —

BMC Systems, Inc., a division of Canada Computer Holdings, Ltd., has acquired exclusive rights to market throughout the U.S. the 1F800 small business microcomputer manufactured by OKI of Japan.

— — —

Able Computer, Inc. has formed a separate research department that will specialize in concepts and designs for next-generation enhancements and other computer products. The new department will be located in Cottage Grove, Ore.

— — —

Amtel Systems Corp. and Specialized Systems, Inc., San Diego, have announced an "amicable settlement" of their prior agreements over the Executel interoffice communications system. Under the settlement, both firms will manufacture and market their own products, Amtel will receive certain royalties from SSI and SSI will receive certain royalties from SSI and SSI will receive certain commissions from Amtel, and Amtel will be entitled to the use of case mold tooling owned by SSI.

— — —

Almac/Stroum Electronics Corp. of Bellevue, Wash., has changed its corporate name to Almac Electronics Corp.

— — —

Tandon Corp. and Micro Peripherals, Inc. (MPI), both of Chatsworth, Calif., have settled their patent infringement suit. The agreement provides for the nonexclusive license to MPI of the Tandon patent for use in its double-sided floppy disk drives. Tandon will receive a lump sum in installments over a four-year period together with a grant of nonexclusive rights as licensee to three of MPI's patents or patent applications.

— — —

Nova Software, Inc., Englewood, Colo., has changed its name to NSI Corp.

— — —

The Nippon Electric Co., Ltd. (NEC) of Tokyo, Japan, has made a $1 million grant to MIT for the establishment of an NEC Professorship of Software Science and Engineering.

— — —

Driver-Harris Co., Harrison, N.J., and AIM Active Services, Inc., Fort Lee, N.J., have reached an agreement for the joint establishment of a new venture, Driver-Harris Systems, Inc. The new venture will offer services in software development, system design and turnkey projects.

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Datalex President Excited by Micro Challenge

By Susan Blakeney
CW Staff

SAN FRANCISCO — Carolyn Morris was working for Hewlett-Packard Co. when one day someone telephoned and said, "I've formed this new company, and I'd like to know if you want to be president."

She accepted the job.

Morris, who had been software product marketing manager for the HP 3000 line of computers, is now the president of that company, Datalex Co., established in February 1981. She took the position because it "looked like fun." Specifically, Morris was excited by the challenge of linking microcomputers to minicomputers and mainframes via Datalex software.

"Micros in this country were introduced as personal computers. In Europe they were introduced as serious machines. We want to do big line applications on micros."

Formal Strategies

Morris stressed that companies need to establish formal microcomputer strategies to alleviate what she termed the pervasive uneasiness people feel toward micros in a mainframe setting and also to ensure consistency in data and operations.

"We don't look at a micro as a separate entity with its own data. We think of it as an integrated machine," she stated.

The place in which Morris now finds herself seems a likely enough place for the former University of Texas math major. Morris joined the DP ranks at Fluor Corp. in Los Angeles, where she worked as an applications programmer and math modeler.

She then moved to a position as programmer/analyst with Control Data Corp. in Sunnyvale, Calif., before joining HP in Cupertino, Calif., where she worked in custom engineering on the HP 3000 and as sales manager and marketing manager.

"I enjoy bringing solutions to people," she summed up.

When asked if she was bothered by the raised eyebrows that often greeted her as Datalex's president, Morris said, "I used to be bothered by the 'isn't she cute' kind of thing. I guess as you get older you tend to mellow.

"I like to make statements," Morris, who is six feet tall, continued. "I like to get people's attention. They either like me or hate my guts — and that's fine."

What is the most important attribute a woman executive should possess? "Agressiveness," Morris maintained. "You also have to do your homework . . . know your business. Develop a synergy with the people around you."

Morris said she likes to hire women, but admitted that she tends to be harder on women than on men. "I think that's because I want so much for them to succeed. I want them to be agressive and obtain the power needed to make decisions. Very few companies put significant women in significant positions."

The single biggest obstacle to women in the business world, according to Morris, is funding — or, more accurately, its absence. She calls it "the venture capitalist factor."

To combat the old-boy-network dilemma, Morris said she practices her own breed of networking with other women and is at present co-authoring a how-to book on obtaining venture capital.

Carolyn Morris

Study Details Field Service

PALO ALTO, Calif. — Field service is currently a secondary factor in user selection of computers and peripherals because selection decisions are based on equipment characteristics, price, vendor reputation and software.

But field service is the most critical factor in long-term account control, according to a research study of 700 users conducted by Prognostics Co. here.

The study, entitled *Computer Systems*, details equipment and service satisfaction levels by vendor and equipment type, with individual equipment and service characteristics shown to impact user satisfaction directly. As satisfaction levels with field service rise for a product, price sensitivity tends to decline, the study asserts.

Computer Systems is priced at $8,500 from Prognostics Co., Suite 154, 770 Welch Road, Palo Alto, Calif. 94304.

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Executive Corner

• August P. Klein has been appointed president and chief executive officer of Integral Data Systems, Inc., Milford, N.H.

• Dr. Edward H. Currie has been appointed president and a member of the board of Lifeboat Associates, New York, N.Y.

• Raymond J. Stauder has been appointed president and chairman of the board of Com-Code Corp., Ann Arbor, Mich.

• E. Joseph Zemke has been appointed president and a member of the board of directors of Auto-Trol Technology Corp., Denver, following the resignation of company President Graham King.

• J. Peter Wilson has been named president and chief executive officer of Ferix Corp., Sunnyvale, Calif.

• Leonard S. Kasendorf has been promoted to senior vice-president at TMI Systems Corp., Lexington, Mass.

• Paul H. Recinos has been appointed vice-president, marketing, at Icon Corp., Cambridge, Mass.

• Brian S. Gaylord has been appointed senior vice-president, marketing support, for Mohawk Data Sciences Corp.'s Systems Division, Parsippany, N.J.

• Bruce W. Johnson has been appointed vice-president of operations for Misso Services Corp., Cockeysville, Md.

• William Clark has joined Alphacom, Inc., Campbell, Calif., as executive vice-president and chief operating officer.

• Patrick Sweeney has been named vice-president of international manufacturing for Wang Laboratories, Inc.

• Gordon Foster has been elected vice-president and chief financial officer of CPT Corp., Minneapolis, Minn.

• Dr. Arnold F. Kanarick has been named vice-president of human resources for Honeywell, Inc., and James C. Skyrms has been promoted to vice-president and general manager of Honeywell's Micro Switch Division.

• Dan Dooley has been named vice-president and group director of National Semiconductor Corp.'s special products group.

• Paul V. Campbell has been appointed vice-president, sales, for the Basic Four Information Systems Division of Management Assistance, Inc., Tustin, Calif.

• Christopher Daly has been named vice-president of marketing at Software Distributors, Culver City, Calif.

• Paul D. Chaison has been named vice-president of research and development at Information Unlimited Software, Inc., Sausalito, Calif.

• Thomas J. Bourke has been named a corporate vice-president at Anacomp, Inc., Indianapolis.

• Patrick Mathews has been appointed vice-president for product development at Insurance Network Systems, Inc., Sparta, N.J.

• David R. Deetz has joined Datapoint Corp., San Antonio, Texas, as vice-president of information switching exchange product development.

• Frederic T. Boyer has been named vice-president of finance and administration for Computer Memories, Inc., Chatsworth, Calif.

• James J. Ledasil, Michael M. Morenstein and Charles H. Warhafting have been named vice-presidents of the Software Products Division of Applied Data Research, Inc., Princeton, N.J.

• George Everhart has been appointed vice-president, marketing, and Ray Foster, vice-president, sales, for the Multi-Task Terminal System Division and Stanley Reese has been named vice-president and general manager of the Minicomputer Peripherals Division for Braegen Corp., Cupertino, Calif.

• Tadeo Taguchi has been elected president of Tochiba America, Inc., Tustin, Calif.

• Earl Rogers has resigned as chairman of the board and chief executive officer (CEO) of Precision Monolithics, Inc. (PMI). Bert Snider, president of Bourns, Inc., has been named chairman of the board of PMI and Dave O'Brien, PMI president, has been given the additional position of CEO.

• Michael R. Ramelot has been appointed vice-president of finance at Cromemco, Inc.

• Michael A. Ford has been named vice-president and general manager of Sci-Com Computer Systems. Sci-Com is a joint venture company formed by Science Management Corp. and two Japanese firms, Seiko-K. Hattori and Co., Ltd., and Tokyo Boeki, Ltd.

• John P. Hefferon has been appointed vice-president/area sales director for Wang Laboratories, Inc.

• James M. Erikson has been appointed executive vice-president of the National Sales Division of United Information Services, Inc., a division of United Telecom Computer Group.

• Richard F. Occhipinti has been named vice-president, finance and administration, for Summa Four, Inc.

• Russell R. Jackson has joined ANA Tech Corp. as vice-president of marketing.

• Norman E. MacGregor has been named vice-president of sales at Central Data Corp..

• Richard Campbell has joined Solutions, Inc. as vice-president and general manager.

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Orders & Installations

American Satellite Co. has signed a contract with USAA-Satellite Communications Co., a wholly owned subsidary of United Services Automobile Association (USAA) to provide a dedicated satellite communications network between USAA's San Antonio, Texas, headquarters and New York, San Francisco, Chicago and Los Angeles. American Satellite will install and operate a fully redundant 12-meter transmit-and-receive earth station at USSA's headquarters.

Science Management Corp. has been awarded a contract by the Immigration and Naturalization Service to design, implement and operate a data capture system for immigrant visas and other related documents. The five-year contract has a projected value of $4.1 million.

Sperry Univac has received an order from Ozark Air Lines for 250 UTS 20 Pars-type terminals for the airline's St. Louis reservation center and the central reservation office in Peoria, Ill. The firm has also received an order from the Lansing, Mich., Board of Water and Light for a 1100/62 system, valued at $1.2 million.

Teleram Communications Corp. has received more than $1 million in orders for its portable terminal systems during the third quarter of 1982. Customers include McGraw Hill Publications Co., The Voice of America, *USA Today*, the *New York Daily News*, and *The Oregonian*.

Planning Research Corp. has received a $3.8 million contract to supply on-line real estate listing services and to publish computer-generated listing books for four boards of realtors comprising the newly formed Arizona Regional Multiple Listing Service.

Anacomp, Inc., Indianapolis, is installing the Bankserv 10600 transaction switching and processing system for the Shawmut Corp. of Boston. Anacomp has also signed five-year agreements to provide on-line data processing services for the King George State Bank of King George, Va., and the Peoples Bank of Stafford, Falmouth, Va.

Superset, Inc., San Diego, Calif., has received orders for its Portable Graphics Mainframe (PGM) from the U.S. Army Concepts Analysis Agencies, Washington, D.C.; the National Aeronautics and Space Agency's Langley Research Center, Hampton, Va.; Lockheed Dataplan, Los Gatos, Calif.; Logicon, Inc., Bellevue, Maine; and the First National Bank of Boston.

Collier-Jackson, Inc., Tampa, Fla., has received an order from PDQ Corp. of Madison, Wis., for three business management software packages.

Foreign Orders & Installations

Cray Research, Inc. will install a Cray-IS/530 computer system for Shell Research, B.V. at the Koninkliijke/Shell Exploratie en Produktie Laboratorium in Rijswikj, The Netherlands, in the second quarter of 1983. The system is valued at $6.7 million.

Amnet, Inc. has received an additional $1.4 million contract award from the Swedish Defense Material Administration for an advanced packet-switching data communications network. The firm has been awarded over $3 million to date for the installation of the X.25-based Swedish private data network. Delivery of the additional packet switches is planned for the second quarter of 1983.

Arbat Systems, Inc. has signed an agreement with the Ubaf Arab American Bank to provide computerized banking services on a facilities management basis. Terms of the agreement were not disclosed.

Cray Research, Inc., has signed a contract with Kernforschungsanlage In Juelich, West Germany, for a Cray X-MP/22. The unit, which is scheduled for installation in late 1983, will be purchased for approximately $11.5 million.

Prime Computer, Inc. received four orders from UK firms for its new 2250 multiuser computer system. Applied Research of Cambridge, CIS (Products) Ltd., House Computer Systems and GMW Computers have all placed orders for the 2250 for use in developing entry-level computer-aided design systems.

Mergers & Acquisitions

Tandy Corp. will acquire Interconnect Telecommunications Systems, Inc. of Lexington, Ky., for an undisclosed amount of cash.

Electronic Data Systems Corp. has acquired Welland Computer Group, Inc., a wholly owned subsidiary of Sun Company, Inc., through the purchase of 100% of Welland's outstanding capital stock.

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Expansions

Integrated Software Systems Corp. has moved its corporate headquarters to a 56,000 sq-ft office building at 10505 Sorrento Valley Road, San Diego, Calif. 92121.

North Star Computers, Inc. will expand its corporate headquarters with the construction of a 46,000 sq-ft facility adjacent to its current San Leandro, Calif., location. The building, scheduled for completion by fall 1983, will bring the firm's total facilities in San Leandro to 160,000 sq ft.

Software Dimensions, Inc. will begin construction of new corporate headquarters in Folsom, Calif. in late November. The firm expects to occupy the new 35,000 sq-ft facility in early 1983.

Altos Computer Systems, Inc., San Jose, Calif., has doubled its production facilities to accommodate company growth. A newly leased two-building complex has increased the firm's facilities from 66,000 sq ft to 200,000 sq ft overall, while the production area has increased from 42,000 sq ft to 91,000 sq ft.

Apollo Computer, Inc. has moved its corporate headquarters to a larger facility housing finance, administration, marketing, engineering and manufacturing at 15 Elizabeth Drive, Chelmsford, Mass.

Anacomp, Inc. will build its new corporate headquarters and computer center complex in central Indiana.

Hewlett-Packard Co. has started building a two-story sales center in Naperville, Ill. The 117,000 sq-ft facility will house a regional training center, computer center and an administrative computer group.

Tres Computer Systems, Inc. and its subsidiaries, **Tres Systems, Inc.** and **Tres International, Inc.**, will relocate this month to new corporate headquarters in Atrium at Bent Tree, just north of Dallas. The new facility, which will house a data center as well as executive and administrative offices, is located at 16775 Addison Road, Dallas.

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• **General Sessions:** Opportunities for users, carriers, vendors and business and policy makers — with over 70 sessions on telecommunications, resource management, investment and justification, cost containment and new applications through high technology networks. **Special interest topics** include the use of satellite communications, local area networks, packet networks, network interconnection, teleconferencing, electronic mail and telecommunications requirements for the "office of the future."

• **Application seminars** emphasize user case-history presentations on such areas as systems requirements; selection of vendors, contracting and user follow-up. Special attention will be given to **electronic mail and office communications (EM/OC)** at CN '83. Business generalists as well as telecomm pros will benefit from seminars on basic to advanced applications with industry specific case histories.

• **In-depth skill seminars** are full day classes led by the communications industry's best professional instructors including college professors and consultants. The optional professional seminars will include lectures, class activity and session workbook.

Registration for the conference program is $395. For the in-depth seminars, the cost is $275 including lunch and text.

There will be something for everyone during these three days of conference and exposition at The Rivergate in New Orleans. Exposition hours are 10 a.m to 4 p.m on Monday, January 31 and Tuesday, February 1 and from 10 a.m. to 2:30 p.m. on Wednesday, February 2.

Lunch is complimentary each day to registered attendees, right in the hall, so you can check out new product ideas, meet old friends and renew contacts on the spot. Or, maximize your on-site idea time — jog early and meet for 7:30 a.m. "Early Bird Rap Sessions" which include coffee and pastry.

Register now by calling Louise Myerow, Registration Manager **toll free 800-225-4698** (617-879-0700 in Mass.). For exhibit information, call or write Judie McDaid, Hajar Associates, 280 Hillside Ave. Needham Heights, MA 02194, 617-444-3946.

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Contracts & Pacts

Honeywell, Inc. has been awarded an eight-year, $50.9 million contract by the U.S. Air Force for four DPS 8/70 systems to be installed at Randolph Air Force Base, San Antonio, Texas. The systems will process all Air Force personnel assignments, enlistments, promotions, training records and relocations for officers and enlisted personnel worldwide.

Computer Mart, Inc. will purchase over $10 million in microcomputers from the Data Systems Division of Pertec Computer Corp. under terms of a recently signed 30-month distribution contract.

Centel Supply, a unit of Centel Communications Co., has signed a $10 million contract with American Telecom, Inc. to purchase the firm's Focus Elite digital private automatic branch exchange through 1983. Centel Supply will distribute the Elite systems to American Telecom's factory-approved dealers throughout the U.S.

Quality Micro Systems, Inc. (QMS) has signed an $8 million contract with the Printing Systems Division of Xerox Corp. for the purchase of Xerox XP12 printers. QMS will add intelligent controllers to the laser printers.

Bunker Ramo Information Systems, an Allied Corp. company, has signed an agreement to purchase and customize Fortune Systems Corp.'s 32:16 microcomputer systems. The multiyear agreement has a minimum value of $15 million.

Callan Data Systems, Inc. has received a $1.5 million contract from Network Research Corp. for its new Unistar 100 system.

Grumman Aerospace Corp. has ordered its second Hyshare 2000 simulation computer system, valued at $1.3 million, from Electronic Associates, Inc.

General Electric Co. has signed an agreement with Precision Visuals, Inc. (PVI) to purchase Di-3000, Grafmaker and other PVI products.

Tab Products Co. has been awarded a $4 million, multiyear contract by Prime Computer, Inc. for 132-column CRT terminals. Prime will include the terminals in an order for 32 minicomputer systems recently received by the firm from the Water Resources Division of the U.S. Geological Survey, Department of the Interior.

Burroughs Corp. of Detroit will purchase an unspecified number of line printers from Centronics Data Computer Corp. of Hudson, N.H.

Televideo Systems, Inc. has signed a licensing agreement with Digital Research, Inc. to offer Digital's GSX, a graphics system extension for Digital's CP/M family of operating systems, along with CP/M-86, on its 1602G and 1602GH 16-bit small business computers.

POSITION ANNOUNCEMENTS

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Requires BS in EE or Computer Science with 3 or more years experience.

SOFTWARE TEST ENGINEERS

Must have experience in software systems testing which includes:

- Definition of software test requirements
- Generation of test plans/procedures
- Test execution and reporting

Extensive software development experience is not required, but you must have enough software experience to accomplish the above.

Prefer 2 to 4 years experience in Software Testing. BS in Computer Science or Math is required.

SYSTEMS PROGRAMMERS

Emphasis is on large-scale real-time distributed data aquisition/processing systems:

- VAX 11/780, PDP 11, Hewlett-Packard and Data General Minicomputers interconnected via the 50 megabyte HYPERchannel network system.
- Computer system interfaced to hardware devices via an ETHERNET NET-ONE systems for hardware control.
- ORACLE relational DBMS.
- AYDIN color graphics terminals.

Prospective candidates should have as a minimum two or more years experience in VAX VMS systems internals, DBMS and networking experience is definitely a plus.

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We are currently accepting resumes. To receive our mini-information packet write to: **Gary Hunt, E-Systems, Inc., Garland Division, P.O. 226118, Dept. SE41, Dallas, Texas 75266.**

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PCS/ADS
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The Johns Hopkins Medical Institutions

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Demonstrably capable of using Structured Techniques in analysis, design, and implementation of DB/DC (IMS, IDMS) based business systems such as Steel Plant Maintainence and MRP.

TECHNICAL SUPPORT SPECIALIST

Minimum of 8 years experience with MVS, TSO, SNA, IMS or IDMS, Capacity Planning, Networking, Hardware/Software Evaluation, Database Administration and managerial skills.

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6 to 6 years experience with the IBM 3705, SNA, and Networking.

GENERAL REQUIREMENTS AND BENEFITS

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APPLICATIONS SOFTWARE DEVELOPMENT

- Financial Systems
- Manufacturing Systems

Requires senior level experience in design, development and implementation of financial or manufacturing applications. Database background essential.

SYSTEMS SOFTWARE DEVELOPMENT

- Database
- On-Line Query
- DOS Systems
- Data Communications
- Integrated Data Dictionary
- Application Development System

Requires extensive background in systems programming or control systems software development within a large IBM mainframe environment. Strong Assembler language skills necessary.

TECHNICAL SUPPORT SPECIALISTS

Requires extensive Assembler with experience in one or more of the following: 3-5 years in systems programming; database systems such as IDMS or IMS, on-line systems such as IDMS/DC or CICS, installing and maintaining BTAM, VTAM, or TCAM.

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If you have been consistently successful in software sales, particularly within the IBM mainframe environment, we can offer you an opportunity to market the most important breakthrough ever in computer software – our 3 level integration of Database, Applications and Decision Support Systems. We are seeking senior marketing professionals to fill these newly created positions nationwide.

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Requires a solid understanding of IBM-based database/data communications software from an on-line applications perspective. Well developed presentation and communication skills are essential for success.

- Manufacturing Systems
- Financial Systems

Will provide implementation support to financial or manufacturing systems users. Requires extensive experience in computer-based applications systems, strong COBOL background and systems or database exposure.

PRODUCT MARKETING MANAGER

- Manufacturing Systems

Technical expertise and excellent presentation skills needed to communicate systems concepts to field sales organization and prospective users. Must be able to develop multi-media presentations and sales support tools. Degree and marketing experience preferred.

MANAGER

- Technical Marketing Communications

Responsible for style and accuracy of staff writers, marketing publications and other print materials and overseeing market research. Strong technical IBM mainframe background and excellent communications skills required.

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High visibility opportunities have been created in key U.S. cities for individuals with a large IBM systems background, instructor capabilities and the skills for user interface.

Ideally, you should have 3-5 years' systems programming experience using Assembler on OS, DOS, MVS, VSE operating systems or several years as a database administrator having designed, implemented and tested/tuned a database such as IMS, IDMS or TOTAL. Teleprocessing background would be helpful (CICS, IMS-DC, Shadow).

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Based in Atlanta and reporting to the development staff, your responsibility will be to provide support, by telephone and in the field, to our customers in the use of our ESCAPE product. You will also assist in the development of product enhancements. This position requires one or more of the following: a thorough knowledge of IMS and Assembly language on IBM mainframes or a database administration background. Specific knowledge of IDMS would be a plus but is not an essential requirement. Success in this role demands strong interpersonal skills and some customer relations experience. Position will involve some travel.

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Position involves working directly with Braun project management teams to define, coordinate and develop the specific computer system requirements necessary to support multi-million dollar construction projects. Responsibilities include the recommendation of alternative application software and hardware products that will satisfy project requirements. BS degree in Business Administration, Engineering or Computer Science with a minimum of 10 years combined experience in computer systems and project management is required. MBA is highly desirable.

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Systems Manager

Successful candidate will plan, direct and manage the work performed by an expanding information systems staff of 20-25 involved in project controls and business systems. A BS degree in Computer Science or a related field with a minimum of 10 years computer systems applications development experience, including 3 to 5 years experience in supervision is required. Advanced degree is preferred.

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Attn: Kathy Del Base (CW)
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If you are a highly motivated self-starter with a proven track record and are looking for an outstanding growth opportunity, with an excellent compensation and fringe benefit package, please send your resume, including salary history, in strict confidence to:

Personnel Manager
Modern Maid Food Products, Inc.
200 Garden City Plaza
Garden City, New York 11530

MARKETING MANAGER

For Software House

(New York -- Long Island)

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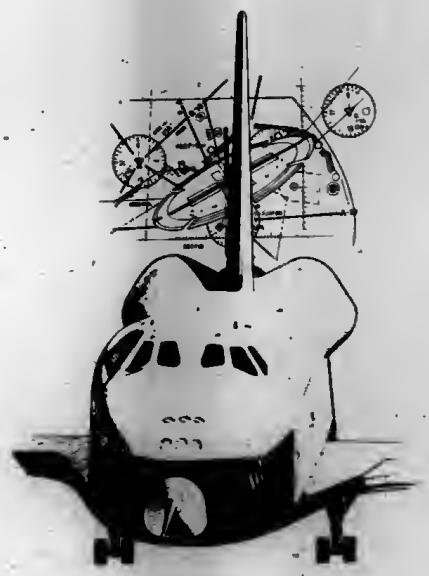

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System Sciences Division
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REQUIREMENTS: Three years of progressively responsible experience in automated systems related to management of complex functions, especially networks and libraries, including at least one year at the GS-12 level in the Federal service or comparable level of difficulty outside the Federal service.

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Responsibilities include the analysis, design, programming, installation and maintenance of database and S/W support tools. Analyzes new and existing database structures and provides technical and analytical support to applications development staff. Effective communication with all users. A qualified candidate's background will include • CODASYL Database knowledge required • COBOL knowledge • On-Line Systems • Data Dictionary design experience (a plus) • 2-4 years' experience • BS degree or equivalent desired.

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•DATA BASE OPENINGS
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These opportunities exist at our Michoud Assembly Facility located in suburban East New Orleans.

Qualified candidates interested in learning more about these opportunities at Martin Marietta should forward resumes, including salary history to Martin Marietta Aerospace, Denver Glazier, CW-1129, P.O. Box 29304, New Orleans, Louisiana 70189. We are an equal opportunity employer, m/f/h.

MARTIN MARIETTA

Medical

Manager

Medical Records Dept. Care Monitoring System

The manager's primary responsibilities include planning and developing programs and reports for the Care Monitoring System (CMS), a computerized medical information system. Duties include producing management reports, evaluating and analyzing data collection, providing quality control, and maintaining responsibility for the CMS budget. The manager also acts as a liaison between the CMS department and the computer and data processing facilities and trains department personnel on new procedures.

A bachelor's degree in Medical Records Administration is preferred to qualify for this position. A degree in Information Systems, A.R.T. certification or a combination of education and experience is desired. Training and experience in computer programming is necessary.

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Los Angeles, Ca 90024

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Programmer III (2 Positions)

Starting salary $818.34 bi-weekly. A programmer/analyst position responsible for applications design and implementation. Qualifications: Minimum-Associate Degree in Data Processing or Bachelor's or Master's degree including thirty-one credits in Data Processing, Computer Programming and/or Computer Science, plus three years of applications programming experience using Basic Assembler and ANS COBOL languages.

For application and job description write Howard E. Rowe, Operations Administrator, M.A.T.C., 211 N. Carroll Street, Madison, WI 53703 or call (608) 266-6031. Application deadline: September 17, 1982.

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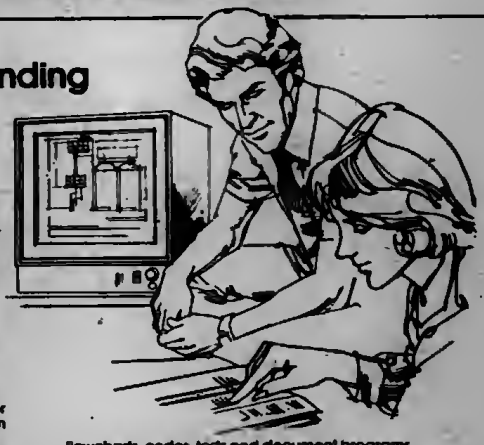

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You're degreed in Computer Science with 3-5 years' experience or you have 6-10 years' related experience. For programming positions, we prefer that you be knowledgeable in COBOL, IMS, ONLINE and possess good problem-solving techniques. You're capable of applying your analytical skills in system design and development of program specifications — and in a project leader capacity, are able to coordinate the activities of others.

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- knowledge of statistics plus familiarity with SPSS, SAS and BMDP;
- experience in a large IBM (370, 3033) TSO working environment;
- an excellent knowledge of English or French (working knowledge of the other language would be a definite asset).

Interested and qualified applicants should send a detailed curriculum vitae to:

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Data Processing

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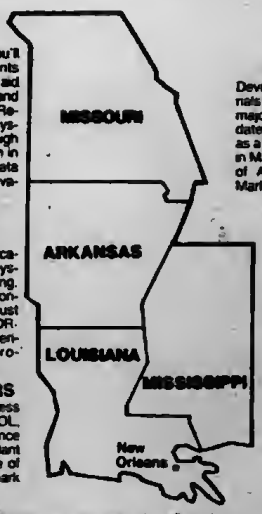

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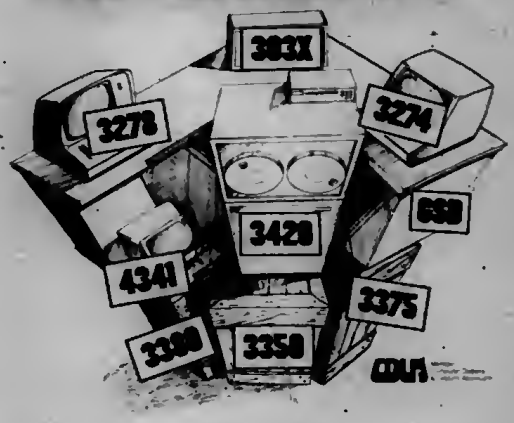

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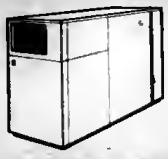

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buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

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3278 DISPLAY STATIONS
3279 COLOR DISPLAY STATIONS
3287 PRINTERS
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For: Furnishing Computer Processing Services for The Parking Violations Bureau.

Proposals will be received by representatives of The New York City Department of Transportation, Parking Violations Bureau, Rm 1017, 40 Worth Street, New York, NY 10013 as follows:

Proposals will be received until 4 PM on the date specified:

Monday, December 20, 1982

Request for proposal documents may be obtained from Mr. Donald Cirillo, Chief, Contracts/Purchase Section, Department of Transportation, Division of Fiscal Affairs, Room 1017, 40 Worth Street, New York, NY 10013, between the hours of 9 AM to 4 PM, Monday - Friday.

For: Furnishing Lockbox Services for the Parking Violations Bureau.

Proposals will be received by representatives of The New York City Department of Transportation, Parking Violations Bureau, Rm 1017, 40 Worth Street, New York, NY 10013 as follows:

Proposals will be received until 4 PM on the date specified:

Monday, December 20, 1982

Request for proposal documents may be obtained from Mr. Donald Cirillo, Chief, Contracts/Purchase Section, Department of Transportation, Division of Fiscal Affairs, Room 1017, 40 Worth Street, New York, NY 10013, between the hours of 9 AM to 4 PM, Monday - Friday.

Wanted to Develop: Hand Held Microcomputer Summons Issuance Device for The Parking Violations Bureau.

Proposals will be received by representatives of The New York City Department of Transportation, Parking Violations Bureau, Rm 1017, 40 Worth Street, New York, NY 10013 as follows:

Proposals will be received until 4 PM on the date specified:

Monday, January 3, 1983

Request for proposal documents may be obtained from Mr. Donald Cirillo, Chief, Contracts/Purchase Section, Department of Transportation, Division of Fiscal Affairs, Room 1017, 40 Worth Street, New York, NY 10013, between the hours of 9 AM to 4 PM, Monday - Friday.

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The Bulletin Board

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Price for each standard unit is only $99 ($115 as of 12/27/82 issue). There is an one unit minimum and no fractional units available. Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld. It's a simple and effective system for buying and selling hardware and software.

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Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

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Signature: ____________________

Name: ____________________

Title: ____________________

Company: ____________________

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The Bulletin Board

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6060A 96MB Disk Add-On	$15,500
6070A 20MB Disk Add-On	$3,800
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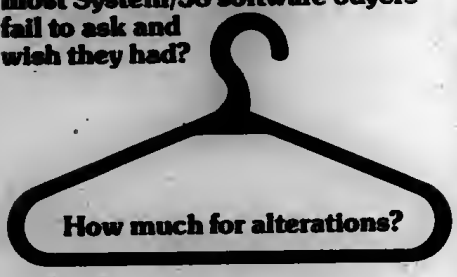

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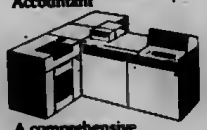

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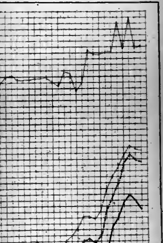

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All statistics compiled, computed and formatted by TRADE QUOTES INC Cambridge Mass. 02139

CLOSING PRICES TUESDAY, NOVEMBER 23, 1982

EXCH		1981-82 RANGE (1)	CLOSE NOV 23 1982	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	AMDAHL CORP	17- 38	30	-1 1/8	-3.6
N	BURROUGHS CORP	28- 48	40 3/8	-2 3/8	-5.6
O	COMPUTER AUTOMATION	7- 17	14	- 3/8	-2.6
N	CONTROL DATA CORP	21- 42	37 1/8	-2 1/4	-5.7
N	CRAY RESEARCH INC	20- 41	30	- 3/4	-2.0
N	DATA GENERAL CORP	20- 58	37	-2 3/8	-6.6
N	DATAPOINT CORP	11- 54	18 1/2	-2 1/4	-10.8
N	DIGITAL EQUIPMENT	62-108	87 7/8	-5 3/8	-5.2
A	EECO INC	8- 11	8 5/8	-1 1/8	-10.4
N	ELECTRONIC ASSOC.	9- 12	10 3/4	- 5/8	+5.4
N	FLOATING POINT SYST	16- 30	22 3/4	-1 1/4	-5.2
N	FOXBORO	22- 38	31 1/4	-1 3/8	-4.8
O	FULCRUM COMP GRP	1- 2	1/4	0	0.0
O	GENERAL AUTOMATION	3- 6	2 7/8	- 1/8	-2.0
N	HARRIS CORP	20- 43	38 7/8	+ 5/8	+1.7
N	HEWLETT-PACKARD CO	38- 71	67 1/2	-1 3/8	-2.2
N	HONEYWELL INC	60-104	97	-5	-4.8
N	IBM	48- 98	91 1/4	-2 3/4	-2.2
O	IPL SYSTEMS INC	6- 9	7 3/4	0	0.0
O	MAGNUSON COMP SYSTS	2- 16	2 5/8	- 3/8	-0.2
N	MANAGEMENT ASSIST	7- 18	11 3/4	- 1/8	-1.0
O	MINI-COMPUTER SYST	1- 4	3/8	+ 1/8	+50.0
N	MODULAR COMPUTER SYS	6- 12	11 1/8	- 7/8	-7.2
N	MOHAWK DATA SCI	10- 16	12 3/8	-1 1/4	-7.4
N	NCR	38- 88	82 1/8	-4	-4.6
N	PERKIN-ELMER	17- 32	27 1/8	-2 1/8	-7.2
N	PRIME COMPUTER INC	18- 38	33 1/2	-2	-2.0
N	SPERRY CORP	21- 37	30 3/8	-1	-3.1
O	TANDEM COMPUTERS INC	14- 34	27 3/8	-2	-6.8
N	TEXAS INSTRUMENTS	71-134	128 1/2	- 3/8	-0.2
A	WANG LABS "B"	25- 54	50 1/4	-2 3/8	-4.0
A	WANG LABS "C"	21- 54	48 5/8	-3 1/4	-5.1
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	22- 28	28 3/4	+2 3/4	+11.4
N	COMDISCO INC	13- 30	29	+1 1/2	+5.4
O	COMMERCE GROUP CORP	1- 1	3/8	0	0.0
O	COMPUTER INVESTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 16	12 1/2	-1 1/2	-8.8
A	DPF INC.	5- 13	10	- 1/8	-1.2
O	ITEL	1- 8	7/8	+ 1/4	+40.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 38	35 1/2	+1	+2.8

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1981-82 RANGE (1)	CLOSE NOV 23 1982	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED CORP TECH	1- 8	2	0	0.0
O	ADVANCED SYSTEMS INC	9- 10	14 1/2	- 1/4	-1.0
O	AGS COMPUTERS INC	7- 12	12	0	0.0
N	ANACOMP INC	6- 10	12	+ 1/4	+1.0
O	ANALYSTS INTL CORP	2- 8	6 1/2	+ 1/4	+4.0
A	APPLIED DATA RES.	10- 41	44 3/8	- 3/8	-0.8
O	ASK COMPUTER SYSTEMS	12- 24	23 3/4	+ 5/8	+2.7
O	ASTRADYNE COMP IND	1- 2	2	- 1/4	-11.1
N	AUTOMATIC DATA PROC	21- 35	33 3/4	+ 3/8	+1.1
O	CGA COMPUTER ASSOC	6- 9	8 1/2	+ 1/2	+6.2
O	COMPUTER ASSOC INT'L	13- 38	38	0	0.0
O	COMPUTER HORIZONS	1- 3	2 3/4	+ 1/4	+7.1
O	COMPUTER NETWORK	4- 8	8 7/8	- 3/4	-8.0
N	COMPUTER SCIENCES	11- 20	17 7/8	- 1/8	-0.6
O	COMPUTER TASK GROUP	6- 18	18 1/2	- 1/4	-1.2
O	COMPUTER USAGE	2- 4	4 1/4	+1	+30.7
O	COMPUTONE SYSTEMS	13- 28	24 1/2	-3 1/8	-11.2
O	COMSERV CORP	11- 20	17 3/4	+ 1/4	+1.4
O	COMSHARE	8- 18	7 1/2	- 3/8	-4.7
N	CULLINANE DATABASE	24- 53	47 3/4	-2 1/4	-4.5
O	CYCARE SYSTEMS INC	8- 18	10 1/4	- 1/2	-2.0
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	1- 4	3/4	0	0.0
O	DYATRON CORP	2- 4	2 1/2	+ 1/8	+5.2
N	ELECTRONIC DATA SYST	18- 48	44	-2 7/8	-6.1
O	INFORMATICS INC	10- 24	21	- 1/8	-0.5
O	INSYTE CORP	1- 2	1 3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 3	1 1/4	0	0.0
O	KEANE ASSOCIATES	4- 8	4 3/4	0	0.0
O	LOGICON	12- 28	23 3/4	- 7/8	-3.5
O	MGMT SCI AMER INC	18- 42	40 1/2	-1	-2.4
O	MATHEMATICA INC	12- 18	14	- 1/4	-1.7
O	MATHEMATICAL APP GRP	12- 18	14 1/4	-3	-17.3
O	NATIONAL DATA CORP	18- 23	18	+ 3/8	+2.0
O	PANSOPHIC SYSTEMS	8- 30	18 3/4	- 1/4	-1.4
A	PLANNING RESEARCH	8- 11	10	- 1/2	-4.7
O	PROGRAMMING & SYS	1- 2	2 3/8	+ 1/8	+5.2
O	REYNOLDS & REYNOLDS	17- 27	25 3/4	0	0.0
O	SEI CORP	21- 43	43 1/2	- 3/4	-1.6
O	SHARED MEDICAL SYST	28- 48	47 1/8	-1 1/8	-2.3
O	SCIENTIFIC COMPUTERS	8- 12	11 1/2	+ 1/4	+2.2
O	SOFTWARE AG	8- 17	11 3/4	-1	-7.8
N	TYMSHARE INC	12- 30	22 7/8	0	0.0
O	UCS CORP	10- 14	12 1/8	- 5/8	-4.8
N	WYLY CORP	7- 13	8 7/8	-1 3/8	-14.1
	PERIPHERALS & SUBSYSTEMS				
O	3A INTERNATIONAL	1- 10	2 3/8	- 3/8	-10.0
A	ANDERSON JACOBSON	8- 23	21 1/4	+ 3/8	+0.8
O	AUTO-TROL TECHNOLOGY	8- 18	17 1/4	+3	+12.1
O	BANCTEC INC	7- 33	12 1/2	-2	-12.0
A	BEEHIVE INT'L	4- 8	7 1/8	+ 3/8	+5.2
N	BOLT,BERANEK & NEW	8- 38	30 1/4	-2 1/4	-8.0
O	CAMBEX CORP	3- 4	2	+ 1/8	+4.3
N	CENTRONICS DATA CORP	6- 17	13 1/2	- 5/8	-4.8
A	CETEC CORP	4- 8	6 1/8	+ 5/8	+10.8
O	COGNITRONICS	2- 6	6 1/4	- 1/4	-3.8
O	COMPUTER COMMUN.	1- 2	3/8	0	0.0

EXCH		1981-82 RANGE (1)	CLOSE NOV 23 1982	WEEK NET CHNGE	WEEK PCT CHNGE
A	COMPUTER CONSOLES	19- 38	38 3/4	0	0.0
O	COMPUTER DEVICES INC	4- 21	12 3/8	-1 3/4	-11.2
O	COMPUTER TRANSCEIVER	4- 7	6 1/8	- 3/8	-2.0
N	COMPUTERVISION CORP	18- 38	21 7/8	-2 7/8	-9.2
N	CONRAC CORP	21- 38	34 1/4	- 3/4	-2.1
A	DATA ACCESS SYSTEMS	2- 8	1 1/4	0	0.0
A	DATAPRODUCTS CORP	18- 23	30 3/4	- 1/8	-0.4
A	DATARAM CORP	6- 8	6 3/4	0	0.0
A	DATUM INC	2- 2	2 3/8	- 1/2	-12.1
O	DAVID JAMIESON CARLYL	2- 7	4 3/8	+ 1/4	+6.0
O	DECISION DATA COMPUT	3- 12	6 1/8	-1 1/4	-12.0
O	DELTA DATA SYSTEMS	1- 6	2 1/8	- 1/8	-5.2
N	ELECTRONIC M & R	8- 6	8 1/2	+ 7/8	+10.6
O	EVANS & SUTHERLAND	18- 41	37 3/4	0	0.0
O	GANDALF TECHNOLOGIES	10- 22	16 5/8	-2 7/8	-14.7
N	GEN'L DATA COMM IND	8- 16	14 3/8	- 5/8	-4.0
O	GENERAL TERMINAL CP	0- 4	1/2	- 1/8	-20.4
O	GREAT SOUTHWEST IND	3- 8	3 3/4	0	0.0
N	HAZELTINE CORP	22- 41	38 1/4	- 1/8	-0.2
O	ICOT CORP	3- 8	6	+2	+34.2
O	INFORMATION INTL INC.	18- 18	16 1/2	-2	-10.0
O	INTEL CORP	21- 42	33 1/2	-2 1/2	-5.4
O	IPL SYSTEMS INC	8- 9	7 3/4	0	0.0
O	LUNDY ELECTRONICS	7- 12	12 7/8	+2 3/8	+22.8
O	MSI DATA CORP	14- 28	24 1/2	-2	-7.2
O	NETWORK SYSTEMS CORP	18- 35	32 7/8	-1	-2.8
O	OMEX	2- 8	2	0	0.0
N	PARADYNE CORP	24- 80	47 3/8	+1 3/8	+3.0
A	PENRIL CORP	7- 12	8 7/8	+ 1/8	+1.2
O	QANTEX CORP	12- 20	18 1/2	- 1/2	-2.6
N	RECOGNITION EQUIP	4- 8	8	- 5/8	-7.2
O	SCAN DATA	1- 2	1	- 1/4	-20.0
N	STORAGE TECHNOLOGY	16- 80	23 7/8	-1 3/8	-5.4
O	SYKES DATATRONICS	8- 34	10 1/8	- 3/4	-5.8
O	T BAR INC	7- 11	6 3/4	- 3/8	-5.3
A	TEC INC	4- 11	7 3/8	- 1/4	-3.2
N	TEKTRONIX INC	34- 58	48 5/8	- 3/4	-1.4
N	TELEX	6- 20	17 1/2	-2	-10.2
O	TESDATA SYSTEMS CP	3- 10	2	0	0.0
O	TIMEPLEX INC	7- 10	10	+ 1/2	+5.4
O	VISUAL TECHNOLOGY	9- 17	19 1/2	0	0.0
O	ZILTEK INC	1- 3	1 7/8	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 18	17 1/2	+ 1/8	+0.7
O	BALTIMORE BUS FORMS	1- 2	1 3/4	0	0.0
N	BARRY WRIGHT	18- 21	38 7/8	+1 7/8	+8.0
O	CYBERMATICS INC	1- 1	7/8	0	0.0
A	DUPLEX PRODUCTS INC	12- 20	18 7/8	+ 3/4	+4.0
N	ENNIS BUS. FORMS	18- 30	28	+ 5/8	+2.2
N	3M COMPANY	48- 78	80 1/8	-5 3/8	-7.2
N	MOORE CORP LTD	28- 41	38	+ 3/4	+1.2
N	NASHUA CORP	8- 18	13 5/8	0	0.0
O	STANDARD REGISTER	22- 71	58	+2	+3.6
O	TAB PRODUCTS CO	12- 22	18 1/4	- 1/4	-1.2
O	WALLACE BUS FORMS	22- 64	88 3/8	-2 1/8	-0.4

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